REPORT 2018

SIMPLE SPATIAL SURVEY METHOD (S3M II)

Federal Ministry of Health
General Directorate of Primary Health Care
National Nutrition Program

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Title: Simple Spatial Survey Method (S3M II) Report
Published by: Federal Ministry of Health, General Directorate of Primary Health Care, National Nutrition Program
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ABOUT THE SURVEY

Following the 2013 publication of a report based on the first Simple Spatial Survey Method (S3M I), this document presents the findings of a second S3M (or S3M II) survey carried out in 2018-2019 in all 18 states of Sudan.

As the name implies, the survey employed the Simple Spatial Survey Method, an area-based sampling methodology that uses settlement locations for sample selection. This methodology was chosen in order to enable mapping of results and produce representative results for small areas. For this survey, the size of the area for which results are available varies according to settlements' density and is approximately 187 square kilometres; results are, therefore, available at national, state, locality and sub-locality levels.

The main advantage of the Sudan S3M II is that it measured a range of indicators in health, nutrition, WASH, child protection, education and food security over small geographical areas, giving results at locality and sub-locality levels. It also allowed mapping of results to show geographical areas of highest need and 'hot spots', and will enable better targeting of existing interventions and inform programme expansion. More than two million children in Sudan are stunted and unlikely to ever reach their full growth and development potential. Identifying where the most vulnerable children in Sudan live will ensure evidence-based, equity-focused programming and distribution of resources.

Data was collected in two phases: for phase one in October 2018 in the states of North Darfur, East Darfur, West Kordofan, River Nile, Sennar, South Darfur, North Kordofan, Khartoum and Northern states; and for phase two from November 2018 to January 2019 in the White Nile, Kassala, Blue Nile, Central Darfur and West Darfur, Red Sea, South Kordofan and Gedaref states.

While data was collected in all states, some areas were inaccessible due to insecurity, including parts of South Kordofan state (Elbouram, Omdorein and Heiban localities) and Abyei protocol area in West Kordofan. Areas with no data collection are clearly shown on all maps. Moreover, in Halaeeb (in Red Sea state) and Sharg El Jabal (in South Darfur state) localities, some sample points were accessible while others were not. In this case, results are presented for the locality with a note that the displayed data only represents a portion of the locality. A total of 230 indicators were measured. All results for every indicator at national, state and locality levels are presented in the form of maps, tables, graphs and are discussed. Results are presented in maps and the corresponding color scale is provided under each map.

Two types of maps are provided in this report:

1. Raster maps interpolation: These represent the intensity of an incident's occurrence and are indicated by the term 'raster'. Generally, green color on the maps indicates a 'good' situation, yellow indicates a 'moderate' situation, and red indicates a 'poor/bad' situation. There is a figure of a country map for each indicator with colors corresponding to the color scale from the key.

2. Choropleth maps interpolation: These use geographical boundaries to represent spatial variation of a quantity. The mapped results display values on a color gradient scale, ranking from low prevalence (cool colors) to high prevalence (hot colors) within geographic boundaries.

The S3M II was conducted by the Federal and States Ministries of Health, UNICEF and other partners, with technical support from Valid International and funding from the European Union, the United Kingdom Department for International Department (DFID), the Italian Agency for Development Cooperation (AICS), and African Development Bank (ADB), in addition to UNICEF, WHO and WFP.

ACRONYMS

ADB	African Development Bank
AICS	Italian Agency for Development Cooperation
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ARI	Acute Respiratory Infection
BCG	Bacillus Calmette-Guerin (vaccine used against tuberculosis)
CBS	Central Bureau of Statistics
CHW	Community Health Worker
CMAM	Community Management of Acute Malnutrition
CSAS	Centric Systematic Area Sampling
CSI	Coping Strategy Index
DFID	The Department for International Department (United Kingdom)
EPI	Expanded Programme on Immunization
FANC	Focused Antenatal Care
FGM	Female Genital Mutilation
FMOH	Federal Ministry of Health
GAM	Global Acute Malnutrition
GMP	Growth Monitoring Programme
GPS	Global Positioning System
H&N	Health and Nutrition
HAC	Humanitarian Aid Commission
HAZ	Height-for-Age Z-score
Hb	Haemoglobin
HF	Health Facility
HH	Households
HIV/AIDS	Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome
HNO	Humanitarian Needs Overview
ICFI	Infant Child Feeding Index
ICT	Information and Communication Technologies
IDDs	Iodine Deficiency Disorders
IDW	Inverse Distance Weighting
IMCI	Integrated Management of Childhood Illnesses
IPC	Intergrated Food Security Phase Classification
ITN	Insecticide-Treated Net
IYCF	Infant and Young Child Feeding
LBW	Low Birth Weight
M/F	Male or Female
MAM	Moderate Acute Malnutrition
MICS	Multiple Indicator Cluster Survey
MOE	Ministry of Education
MOH	Ministry of Health
MOSSW	Ministry of Security and Social Welfare
MUAC	Mid-Upper-Arm Circumference
NISS	National Intelligence and Security Services

ORS	Oral Rehydration Solution
ORT	Oral Rehydration Therapy
PC	Principal Carer
PHC	Primary Health Care
PLW	Pregnant and Lactating Women
PSUs	Primary Sampling Units
RCSI	Reduced Coping Strategy Index
SAM	Severe Acute Malnutrition
S3M	Simple Spatial Survey Method
SDGs	Sustainable Development Goals
SMART	Standardized Monitoring and Assessment of Relief and Transitions
SMOH	State Ministry of Health
TORs	Terms of Reference
U5	Under five
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation and Hygiene
WAZ	Weight-For-Age Z-score
WDDS	Women Dietary Diversity Score
WFP	World Food Programme
WHO	World Health Organization
WHZ	Weight-For-Height Z-score
WRA	Women of Reproductive Age

EXECUTIVE SUMMARY

The Federal Ministry of Health (FMOH) recently commissioned, from October 2018 to January 2019, a national survey known as the Simple Spatial Survey Method (S3M) in order to inform national programming and programme scale-up. The survey gathered data on 230 critical indicators regarding the following broad topics: health; nutrition; water, sanitation and hygiene (WASH); and child and social protection. The S3M is a large-scale survey method originally developed from the Centric Systematic Area Sampling (CSAS) coverage survey method[1] as a response to the widespread global adoption of community management of acute malnutrition (CMAM) by ministries of health. The first national-scale multi-indicator S3M survey in Sudan was conducted in 2013 after two consecutive, state-level pilot coverage surveys were conducted in Gedaref and Sennar states in 2012. The second-round survey of 2018–2019, known as S3M II, used an area-based sampling methodology in all 18 Sudanese states and their corresponding localities and sub-localities[2] (settlement locations) in order to map and produce representative results for small areas (approximately 187 square kilometers). The mapping of results from the 230 indicators in the sub-locality levels helped to demonstrate geographical areas of highest need and 'hot spots' to help inform programme expansion. The FMOH worked in close collaboration with the Sudan United Nations Children's Fund (UNICEF) to administer the survey, with technical assistance from other partners including Valid International.[3] The survey was funded by the European Union, the United Kingdom Department for International Department (DFID), the Italian Agency for Development Cooperation (AICS), and the African Development Bank (ADB), in addition to UNICEF, the World Health Organization and the World Food Programme.

This report provides the output and detailed country-level analysis and synthesis for phase one (October 2018)[4] and phase two (November 2018 to January 2019[5]) of the FMOH S3M II spatial mapping for health, nutrition, WASH, child and social protection indicators. The overall project aims to better understand how spatial analysis can help to coordinate and co-locate relevant programmes according to overlapping data from various indicators. In addition, data on the various indicators are rarely accurately mapped and prevalence data is often only specified at the regional and state levels.

The report provides details about the following points:

- key findings for each technical area and relevant indicators
- methodology
- results and discussion of those results
- preliminary conclusions
- preliminary recommendations

In Chapter 2, the methodology used is described including: the S3M sampling method; primary sampling units (PSUs); detailed indicators including the definition, numerator and denominator; details on the survey

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1 Myatt, Mark, et al.,'A Field Trial of a Survey Method for Estimating the Coverage of Selective Feeding Programmes', *Bulletin of the World Health Organization,* vol. 83, no. 1, January 2005, pp. 20–26.

2 It should be noted that in some localities, some sample points were accessible while others were not.

3 Valid International, 'Valid International – Bringing about Change in Humanitarian Practice', <www.validinternational.org/>, accessed 15 January 2020.

4 Data for phase one was collected in October 2018 in the following states: North Darfur, East Darfur, West Kordofan, River Nile, Sennar, South Darfur, North Kordofan, Khartoum and Northern states.

5 Data for phase two was collected from November 2018 to January 2019, in the following states: White Nile, Kassala, Blue Nile, Central Darfur and West Darfur, Red Sea, South Kordofan and Gedaref states.

implementation including the survey planning and preparation and its ethical approvals; obtaining detailed maps of every state; engaging technical expertise; identifying staff; carrying out the sampling; training the staff[6]; explaning data collection, entry and analysis[7]; and, finally, a description of the analytical approach for mapping indicators.

In Chapter 3, the results and discussion section include the detailed results and an analysis of the identified topics based on the indicators for the following:

1. Child nutritional status
2. Childhood anaemia
3. Infant and young child feeding
4. Coverage of growth monitoring and screening using MUAC and IYCF counseling
5. Child vitamin A supplementation coverage
6. Maternal nutrition
7. Women's diets
8. Salt iodization
9. Female genital mutilation
10. Childhood illnesses and treatment-seeking behaviour
11. Antenatal and postnatal care coverage
12. Antenatal iron and folic acid (IFA) supplementation
13. Postpartum care coverage
14. Coverage of expanded programme on immunization
15. Coverage of insecticide-treated nets
16. Time to health facility
17. Coping strategies index
18. Health and nutrition information awareness and access
19. Health and nutrition messaging and communication channels/medium
20. Water, sanitation and hygiene
21. Education
22. Child protection
23. Child health insurance

Each topical section contains several elements: a box plot[8] or two that displays the average state and locality results; a set of two tables that illustrates the mean prevalence by state and at the national level; a table comparing the indicators' prevalence by locality and by state; a set of figures that show interpolated indicator surface raster maps and choropleth maps using indicator estimates at state level.

[6] The training of staff, upon the identification of staff included all of the supervisors including the 9 UNICEF supervisors, the 4 WHO supervisors, the 18 SMOH supervisors and the 20 FMOH supervisors.

[7] For this survey, the blocked weighted bootstrap estimation approach was used.

[8] A box plot is a method for graphically depicting groups of numerical data through their quartiles. Box plots may also have lines extending vertically from the boxes (whiskers) indicating variability outside the upper and lower quartiles, hence the terms box-and-whisker plot and box-and-whisker diagram. Outliers may be plotted as individual points. Box plots display variation in samples of a statistical population without making any assumptions about the underlying statistical distribution.

The *S3M II* has these two types of data maps for each indicator in this report. The first is the raster maps' interpolation of intervention intensity, which represents the intensity of an incident's occurrence and is indicated by the term 'raster map'[9]. The figures of a raster country map highlight the corresponding colors indicated from the key color scale. Generally, green color on the maps indicates a 'good' situation, yellow indicates a 'moderate' situation, and red indicates a 'poor/bad' situation. Secondly, the choropleth maps' interpolation uses geographical boundaries to represent spatial variation, grouping data together in states. The mapped results display values on a color gradient scale, ranking from low prevalence (cool colors) to high prevalence (hot colors) within geographic boundaries. The main advantage of the *Sudan S3M II* is that it measures a range of indicators— health, nutrition, WASH, child protection, education and food security— over small geographical areas, giving results at locality and sub-locality levels. These maps use the indicators to identify as precisely as possible where the most vulnerable carers and children in Sudan live. The use of this type of fine-grained data can help to ensure evidence-based, equity-focused programming and distribution of resources. Chapter 4 highlights a preliminary synthesis of the conclusions that can be derived from the data and Chapter 5 highlights some high-level recommendations for future programme implementation.

The multi-indicator data used in mapping comes from the survey conducted. The rationale for the current use of spatial mapping for health, nutrition, and child and social protection programmes largely matches the key elements of a project management cycle in terms of a focus on problem identification through the use of prevalence maps. Coverage maps have been produced and are common for evaluation purposes; but ongoing, active monitoring using spatial data is not widespread. The key advantage of spatial analysis to users is its capacity to unmask variability and show accurate, detailed and differentiated patterns on multiple indicators across a programme area in a striking visual format. This is in contrast to the limited value of normal programme planning with highly aggregated data. Programme planning and resource allocation continue to be dominated by highly aggregated results from traditional, nationally representative surveys. Programme and policy decisions are often made without taking account of in-country spatial variation. A successful programme must correctly identify where the need is most acute and target cross-sector interventions to ensure a cohesive and effective response. The use of spatial maps also may facilitate coordination of programmes across sectors, pinpointing areas of overlap among interventions, along with areas of need or '*hot spots*'. Spatial mapping can identify hot spots and overlap, and influence planning, implementation, monitoring and coordination. The following is a summary of the results from the 25 topical areas:

Child nutritional status and childhood anaemia: In terms of the nutritional status of children 6-59 months of age, national prevalence of child stunting was 36.35 per cent, with 21.25 per cent moderate stunting and 15.06 per cent severe stunting. There was great variability in stunting prevalence across states, with 47 per cent of all localities experiencing stunting levels greater than 40 per cent. Child underweight prevalence was 29.16 per cent, with 21.14 per cent moderate underweight and 7.93 per cent severe underweight; across states and localities, the range was from 20.9 per cent to 44.3 per cent. Wasting measured by mid-upper-arm circumference (MUAC) was 9.5 per cent nationally; across the states, wasting was highest in Red Sea state (29.6 per cent) and lowest in Khartoum state (5.24 per cent). Severe wasting measured by weight-for-height Z-score was 2.72 per cent nationally, with Red Sea state showing the highest prevalence rate (10.95 per cent). Among localities, 56 of the 185 localities had a severe acute malnutrition (SAM) rate, defined as WHZ wasting prevalence of over 3 per cent. SAM as measured by MUAC was at 1.76 per cent across the country. Red Sea state had a significantly higher prevalence rate of SAM, at 8.5 per cent, while Northern state had the lowest at 0.69 per cent. Among specific localities, a markedly higher prevalence of SAM was noted in three of them: El Ganab Elawlaib (10.13 per cent); Sinkat (11.24 per cent); and Tokar (14.97 per cent). On the other hand, national childhood overweight prevalence was 2.14 per cent, while obesity was at 0.85 per cent. Al-Gadarif state

[9] A raster map is basically a 'dumb' electronic map image made up of a set number of pixels. Rasters are digital aerial photographs, imagery from satellites, digital pictures or even scanned maps.

had the highest prevalence of overweight and obese children. Relatively high rates of obesity were also found in some areas in Red Sea, Northern, Sennar, Blue Nile and Darfur states. Child nutrition oedema prevalence was low at 0.18 per cent. Among states, Central Darfur, West Darfur and North Darfur had a significantly higher prevalence of nutrition oedema relative to others. Finally, in terms of child anaemia, the national prevalence was 48.09 per cent, with 23.72 per cent mild, 22.52 per cent moderate and 1.68 per cent severe. Across states, 33.3 per cent had more than 50 per cent of children with anaemia. East Darfur state had the highest prevalence of anaemic children (66.44 per cent), while West Darfur had the lowest (32.99 per cent).

Infant and young child feeding: The national exclusive breast-feeding prevalence was 62.31 per cent, with 73.29 per cent age-appropriate continued breast-feeding up to 2 years of age or beyond, 63.24 per cent age-appropriate meal frequency and 25.40 per cent age-appropriate dietary diversity. All IYCF indicators were near-evenly distributed throughout Sudan. The infant and child feeding index (ICFI), which is an age-specific composite index, was used to assess complete feeding practices for infants and young children. Among children from 6-23 months, the average ICFI score[10] was 3.75 out of 6, and 'good' IYCF among children from 0-23 months was 22.33 per cent. For complementary feeding, 78.59 per cent of children 6-8 months were introduced to solid or semi-solid foods and 43.22 per cent had a 'good' IYCF *(see page 98).* Complementary feeding indicators were relatively high at the state level, with very small inter-state variability. Child consumption of protein-rich foods was low, at 28.85 per cent overall, with 24.36 per cent consuming protein from animal sources and 6.66 per cent consuming protein from plant sources. Child consumption of vitamin A-rich foods from any source was low, at 23.44 per cent, with 19.02 per cent of children getting it from animal sources and 6.56 per cent getting it from plant sources. Fewer than 50 percent of children consumed vitamin A-rich foods in the two weeks prior to the survey in 87.1 per cent of localities; by contrast, 20 per cent of the localities had no children who consumed vitamin A-rich foods at all in that period. The proportion of child consumption of iron-, calcium- and zinc-rich foods was low, at 12.28 per cent, 17.62 per cent, and 14.99 per cent respectively, with little variability across states and localities. Overall, children showed a low level of consumption of vitamin B-rich foods, with a few localized areas of high consumption. Child consumption of vitamin B6-, B12-, and B-complex-rich foods was low at 18.83 per cent, 25.78 per cent, and 11.02 per cent respectively with small variability among states.

Coverage of growth monitoring and screening using MUAC and IYCF counseling: Coverage of screening for acute undernutrition cases using MUAC in the month prior to the survey was extremely low at 6.03 per cent. There was low coverage of GMP (7.55 per cent) throughout Sudan. The WHO guidance for breast-feeding counseling calls for counseling for all pregnant women and mothers with young children, counseling during both the antenatal period and postnatally, and counseling for up to 24 months or longer.[11] Coverage of IYCF counseling was moderate at 38.36 per cent.

Child vitamin A supplementation coverage: Coverage of vitamin A supplementation in children was low at 39.79 per cent for the six months prior to the survey. Some areas with significantly high coverage of vitamin A supplementation included: the southern parts of Red Sea state; Kassala state; Blue Nile state; the central part of Khartoum state; the southern part of Kordofan state; and parts of North Darfur state. Only 34 per cent of localities achieved coverage greater than 50 per cent.

Maternal nutrition including women's diets: In terms of maternal nutritional status, there was a relatively low prevalence of global acute malnutrition (GAM) – an average of 8.63 per cent - among women of reproductive age (WAR), which is defined as women aged 15-49 years. Moderate acute malnutrition (MAM) was 6.36 per cent, and SAM was 2.18 per cent. Red Sea state had the highest prevalence of GAM (18.15 per cent), and Kassala state had the highest rate of SAM (3.76 per cent).

[10] The ICFI score is based on three variables: breastfeeding, dietary diversity and meal frequency.

[11] World Health Organization, 'Essential Nutrition Actions: Mainstreaming Nutrition through the Life-Course', WHO, Geneva, 2019, <https://apps.who.int/iris/bitstream/handle/10665/326261/9789241515856-eng.pdf?ua=1>.

Women's protein consumption (from both animal and plant sources) was high (82.82 per cent) and came predominantly from animal sources. A decreasing trend in consumption of protein-rich foods was observed from the eastern to the western parts of the country. The average women's dietary diversity measured by the women's dietary diversity score (WDDS)[12] was low at 2.95 food groups out of 9. Khartoum state had the highest mean WDDS at 3.55 food groups, while East Darfur state had the lowest with 1.79 food groups. The level of consumption of vitamin A-rich foods for WRA was moderate (67.36 per cent), with the greater part coming from animal sources. Across states, there was great variability: high levels of vitamin A intake were noted in North and South Darfur, while East Darfur state had the lowest vitamin A-rich food consumption from any source. Consumption of iron-rich foods was relatively high among women (66.75 per cent). Blue Nile had the highest proportion of consumers, while Red Sea state and parts of North and East Darfur had the lowest proportion. Consumption of calcium-rich foods was relatively low among women, at 47.69 per cent. More than 70 per cent of women were consuming calcium-rich foods in only one of the 18 states. Kassala state had the highest proportion, while Blue Nile state had the lowest. Consumption of zinc-rich foods was relatively low among women nationally (69.72 per cent); across states, 50 per cent had more than 70 per cent of women who consumed zinc-rich foods with the highest proportion of consumption in Blue Nile state. Consumption of vitamin B-rich foods was generally high among WRA (62.13 per cent), although only 33.3 per cent of states had more than 70 per cent of women consuming vitamin B-rich foods. A considerable inter-state variability was observed with Al-Gazeera state having the highest proportion and East Darfur state having the lowest. Vitamin B3-rich food consumption was particularly poor in some areas of Red Sea, Kassala and Kordofan states, along with portions of the Darfur states.

Salt iodization: Household use of adequate amounts of iodized salt had declined substantially since the last national survey. In only three localities did the use of iodized salt reach 50 per cent of higher.

Female genital mutilation: Prevalence of female genital mutilation (FGM) among carers was high (83.87 per cent). FGM was extremely high in North Kordofan state (97.74 per cent), while Central Darfur and West Darfur states had the lowest prevalence of FGM.

Childhood illnesses and treatment-seeking behaviour: Prevalence of diarrhoea among children during the survey period was 23.98 per cent, with a few confined areas of high prevalence spread throughout the country. Of children who experienced diarrhoea during the survey period or two weeks prior, 62.87 per cent visited a health facility; of these, 56.46 per cent were provided with oral rehydration salts (ORS), either alone or with other interventions. Prevalence of acute respiratory infection (ARI) among children in the two weeks prior to the survey was 23.73 per cent. South Kordofan state had the highest period prevalence of ARI, and Northern state had the lowest prevalence. Of the children who experienced ARI in the previous two weeks, 70.10 per cent visited a health facility and of these, 74.72 per cent were provided with treatment for the ARI. Prevalence of fever during the survey period was 23.13 per cent, with the highest prevalence in South Darfur state, and the lowest prevalence in Northern state.

Recognition of danger signs: The ability of carers to recognize danger signs was concerning at only 1.67 signs (out of 5 signs[13]), ranging from 0.86 to 2.01 across states and inter-states. Of all danger signs, fever was the most commonly recognized by carers (81.84 per cent).

[12] A woman of reproductive age is considered to consume a diet of minimum diversity if she consumed at least five of 10 specific food groups during the previous 24 hours (both day and night). The 10 food groups included in the MDD-W indicator are: 1. Foods made from grains, white roots and tubers, and plantains (white flesh); 2. legumes/pulses (beans, peas and lentils): mature beans or peas (fresh or dried seed); 3. nuts and seeds; 4. dairy: milk (NOT SOY) and milk products; 5. meat, poultry and fish/seafood; 6. eggs; 7. dark green leafy vegetables: (exclude herbs eaten in small amounts); 8. other vitamin A-rich fruits and vegetables ; 9. other vegetables; 10. other fruits. Source: Food and Nutrition Technical Assistance, 'Introducing the Minimum Dietary Diversity – Women (MDD-W) Global Dietary Diversity Indicator for Women', FANTA Project/FHI360, Washington, D.C., 15 July 2014.

[13] Four signs from IMCI guidelines are: 1) not feeding or poor suck; 2) convulsions; 3) drowsiness or weakness; 4) vomiting. There are four other signs that are just as important for mothers to recognize and to seek care for; but on their own are not danger signs unless accompanied by one of the previous four signs. The additional signs are: 1) bloody diarrhoea; 2) fever; 3) becoming progressively sicker; 4) difficulty breathing.

Antenatal and postnatal care coverage: In the health system, antenatal care (ANC) was the main delivery platform for maternal nutrition services. In terms of ANC quality[14], 51.24 per cent of women across the nation attended four or more ANC visits. Khartoum state had the highest attendance rate (79.63 per cent) of expectant mothers, while Central Darfur state had the lowest attendance (21.98 per cent). In the specific localities of Sharg El Jabal (accessible parts) and North Jebel Mara, no carer attended four or more ANC visits during their last pregnancy. The provision and uptake of quality and timely ANC is an essential element of efforts to improve health outcomes for women and newborn babies. Antenatal consultations assist in early identification and treatment of complications during pregnancy. The differences in the recommended timing of initiation of ANC were evident as the *S3M II* results reveal that women throughout the country make their first ANC visit relatively late, at 3.44 months into gestation. In Sudan, women are recommended to have at least four ANC visits (FANC/ basic ANC model [15]) during which they receive IFA supplements. In the FANC-plus model, however, all pregnant women should have a minimum of eight ANC visits[16], which can include a combination of facility- and community-level ANC contacts, to encourage a positive pregnancy experience and facilitate identification of medical problems early on to reduce the risk of stillbirths. Among localities, the earliest ANC visits were in Kassala and North Darfur, at 1.88 months. Some localities in South Darfur and Red Sea had the latest visits of all, at an average 6 months and 6.65 months into gestation respectively. Survey results indicated that pregnant women in Sudan only attended an average of 3.77 ANC visits during their pregnancy, far from the recommended eight visits under the FANC-plus model. Most alarming were the rates of non-attendance to ANC visits, which was relatively high (16.2 per cent). Among the states, Central Darfur had the highest rate of ANC non-attendance (46.64 per cent), while Northern state had the lowest (4.94 per cent). Some specific localities had particularly high attendance problems; specifically, 17 localities had ANC non-attendance rates above 40 per cent. Those localities were found in the following places: Central Darfur, five localities; South Darfur, five localities; West Darfur, two localities; and the remaining localities are in Al-Gadarif, Blue Nile, East Darfur and Red Sea states.

In terms of postnatal care, a low coverage[17] of postnatal care was found throughout the country, with only 34.2 per cent of mothers served. Postnatal care coverage was defined by the percentage of principal carers who reported receiving a health check while in a facility or at home following delivery, or a postnatal care visit within two days after the last delivery. Northern state had the highest rate (64.74 per cent), while Central Darfur state had the lowest coverage (7.89 per cent). Great variability was noted among localities as Red Sea state had coverage as high as 86.42 per cent, while several localities in South Darfur, Central Darfur and East Darfur had postpartum coverage of less than 10 per cent. Vitamin A supplementation for lactating women was low- with 48.1 per cent of localities showing coverage of less than 15 per cent. Postpartum self-reported night-blindness was 13.04 per cent across the country. Tetanus vaccination coverage was relatively high at 67.34 per cent. The highest prevalence was Khartoum state (85.01 per cent), and the lowest was Central Darfur state (38.02 per cent). Across localities, prevalence ranged from 93.47 per cent coverage in South Darfur to 4.24 per cent in Red Sea state.

Antenatal iron and folic acid supplementation during pregnancy: A key Government of Sudan strategy is to strengthen the coverage and quality of iron folic acid supplementation for pregnant women through ANC services. The national protocol is routine daily oral IFA supplementation for pregnant women[18]. The

[14] The demographic health surveys define quality ANC to be when a woman receives four or more ANC visits, of which at least one is from a medically trained provider, and all the basic components of ANC are present, including weight and blood pressure measurements, urine and blood tests, and information on signs of possible complications.

[15] The FANC basic ANC model incudes four visits: First Trimester: Visit 1: 8–12 weeks; Second Trimester: Visit 2: 24–26 weeks; Third Trimester: Visit 3: 32 weeks, Visit 4: 36–38 weeks

[16] The FANC Plus model 2016 has eight visits: Contact 1: before 12 weeks; Contact 2: 20 weeks; Contact 3: 26 weeks; Contact 4: 30 weeks; Contact 5: 34 weeks; Contact 6: 36 weeks; Contact 7: 38 weeks; Contact 8: 40 weeks; Return for delivery at 41 weeks if not yet given birth.

[17] Receiving a health check while in facility or at home following delivery, or a post-natal care visit within two2 days after the last delivery

[18] Reproductive, maternal, newborn, chid and adolescent health and nutrition (RMNCAH & N) Strategic Plan for Sudan, 2016.

percentage of mothers who reported receiving IFA tablets for at least three months was 44.98 per cent; this information was confirmed when the enumerator presented sample tablets during the data collection process.

Coverage of expanded programme on immunization: The coverage provided by the expanded programme on immunization (EPI) forms the foundation of global public health action for child survival and disease prevention. The availability of a child vaccination card and coverage of Bacillus Calmette-Guerin (BCG), the vaccine used against tuberculosis, are good proxies for initial access to EPI services. In terms of access to EPI services or vaccination cards, 61.74 per cent of children 0-2 years of age nationally had a vaccination card, and in only 11.9 per cent of the localities did at least 80 per cent of children aged 0-2 years have a vaccination card. In terms of BCG vaccine coverage for children 0-12 months of age, it was 77.58 per cent. Blue Nile state had the highest coverage, while Central Darfur state had the lowest coverage. Only in 48.1 per cent of the localities did 80 per cent or more of the children younger than 12 months receive a BCG vaccination. A pentavalent vaccine, also known as 5-in-1 vaccine, is a combination vaccine with five individual vaccines conjugated into one, and it is intended to actively protect people from multiple diseases. In Sudan the pentavalent vaccine is composed of a vaccine that protects children against diseases such as diphtheria, pertusis, tetanus, septicemia, hepatitis B and pneumonia. It replaces the traditional trivalent (DPT) vaccine; however the schedule of 6, 10 and 14 weeks for immunization remains the same.[19] Pentavalent vaccination coverage for children younger than 12 months was 75.98 per cent for the first dose, but a substantial drop in coverage was verified for the third dose at only 59.04 per cent; this is equivalent to a drop-out rate of 16.94 per cent. In only 43.2 per cent of localities did at least 80 per cent of children younger than 12 months receive the first dose of the pentavalent vaccination. Oral polio vaccine coverage for children 0-12 months of age was relatively high for the first dose (72.66 per cent), but only 56.86 per cent received the third dose; this shows a drop-out rate of 15.8 per cent. In only 31.4 per cent of the localities did 80 per cent of children 0-12 months of age receive the first dose of oral polio vaccine. Measles vaccine coverage for children 0-12 months of age old was low (28.5 per cent) for the first dose. The proportion of children 0-12 months old across Sudan who received full EPI coverage (see indicator's definition above) was 26.74 per cent. Khartoum state had the highest full EPI coverage, while North Kordofan state had the lowest coverage. In none of the localities did at least 80 per cent of children have full EPI coverage.

Coverage of insecticide-treated nets: The proportion of children under 5 years of age who reportedly slept under an insecticide-treated net the night before the survey was 38.48 per cent. Blue Nile state had the highest proportion of children sleeping under ITNs, while Red Sea state had the lowest. Of localities, only 42.7 per cent of localities achieved greater than 50 per cent coverage in ITN utilization.

Time to health facility: A known barrier to accessing health services is a long distance to health facilities. Thus, one of the indicators examined was the time it took to reach a health facility. Survey results revealed that 63.99 per cent of carers said that they could access a health facility within 30 minutes, with the average time needed to reach the nearest health facility across states ranging from 30 minutes to 2 hours. Most carers also reported that when they visited the nearest health facility, a community health worker, medical assistant or midwife attended them.

Coping strategies index: The reduced coping strategy index (rCSI) is used to assess the level of stress faced by a household due to a food shortage. It is measured by combining the frequency and severity of the food consumption-based strategies that households use. It is calculated using the five standard strategies using a seven-day recall period. Among households across Sudan, 2.19 per cent of households were found with low CSI scores, 3.39 per cent with moderate CSI scores, and 12.21 per cent with high CSI scores.

[19] WHO | Regional Office for Africa, 'South Sudan Launches Five-in-One Pentavalent Vaccine', <www.afro.who.int/news/south-sudan-launches-five-one-pentavalent-vaccine>, accessed 15 January 2020.

Health and nutrition information awareness and access: Awareness of community management of acute malnutrition (CMAM) programmes was at 53.74 per cent throughout the country. Among states, awareness of CMAM ranged from 85.3 per cent to 37.08 per cent. High variability was noted among localities, with almost 0 per cent awareness in some localities in South Darfur. Awareness of growth monitoring programmes (GMP) was even lower, at only 42.23 per cent across the country. North Kordofan had the highest level of awareness of GMP at 69.6 per cent, and Central Darfur had the lowest awareness at 16.79 per cent. Many localities (72.4 per cent) had less than 50 per cent awareness of GMP. In some localities in South and Central Darfur, carers reported 0 per cent awareness of the GMP.

Health and nutrition messaging and communication channels/medium: According to the survey, 46.75 per cent of carers reportedly received health and nutrition messages in the past month. There was great variability of communication coverage among states, with coverage ranging from 24 per cent to 75.51 per cent. Some carers in East and South Darfur state reported that they had never received a single health and nutrition message. Carers' most highly preferred messaging source of health and nutrition information was outreach workers, named by 34.65 per cent of carers across the country. Radio was next at 21.2 per cent, and then came television broadcasting at 19.73 per cent. The Sudan TV channel was cited as the most popular television channel, preferred by 7.87 per cent of all caregivers, and the Sudan National radio station was the most popular radio station, preferred by 8.72 per cent of all carers. Mornings and evenings were the preferred times to receive communications by 16.85 per cent and 17.28 per cent of the caregivers respectively.

Water, sanitation and hygiene: The WHO-UNICEF Joint Monitoring Programme (JMP) has established a standard set of drinking water and sanitation categories for monitoring purposes. An improved drinking-water source is one that, by nature of its construction and when properly used, adequately protects the source from outside contamination, particularly fecal matter. In terms of drinking water access, the proportion of households with access to improved sources of drinking water was 83.03 per cent across Sudan. On average 73.73 per cent of households had access to basic drinking water sources within 30 minutes of their home.

An improved sanitation facility hygienically separates human excreta from human contact.[20] The JMP sanitation ladder similarly graduates households from no sanitation facilities at all, to those using technologies defined by the JMP as unimproved, to those sharing sanitation facilities of otherwise acceptable technology, to those using improved sanitation facilities.[21] In terms of sanitation access, the proportion of households with access to improved toilet facilities (shared or non- shared) was low at only 37.4 per cent, and 2.7 per cent of localities had no access to improved toilet facilities at all. Households in Northern state had the highest access to toilet facilities, while South Kordofan had the lowest access. On the other hand, the proportion of households practicing open defecation was 33.12 per cent, and Red Sea state had the highest level of open defecation (70.02 per cent). In terms of handwashing awareness, only 7.37 per cent of carers were able to identify all key handwashing events needed (before eating, before preparing food, after defecation, after cleaning child, and before child feeding). Handwashing before eating was the most commonly identified event. In about 16.8 per cent of localities, none of the carers were able to identify all five handwashing events.

Education: In terms of access to basic education, 80.74 per cent of children had access to basic (primary)[22] education across Sudan, of which males had slightly higher access (81.95 per cent) than females (79.57 per cent). Very low access to education was verified in some areas in Red Sea, Kassala,

[20] World Health Organization and United Nations Children's Fund, 'WHO / UNICEF Joint Monitoring Programme: Wat/San Categories', <https://washdata.org/monitoring/sanitation>, accessed 24 April 24, 2017.

[21] World Health Organization and United Nations Children's Fund, 'WHO / UNICEF Joint Monitoring Programme: Wat/San Ladder', <https://washdata.org/monitoring/drinking-water>, accessed 24 April 24, 2017.

[22] The net basic enrolment rate is the ratio of official school-age children enrolled in primary school to the total population of children of official primary school age, as defined by the national education system (disaggregated by gender).

Central Darfur and South Darfur states. About 90.8 per cent of localities had greater than 50 per cent of children with access to basic education. The proportion of children with access to either preschool or basic education was 72.13 per cent, with 73.0 per cent for males and 71.53 per cent for females. Across states, Northern state was leading in terms of access to education, while in West Darfur and Central Darfur states, children had less access to education. More than 50 per cent of children had access to preschool or basic education in about 76.8 per cent of localities. The most common reasons given for children not attending school were fees-related, followed by distance to school and the unavailability of schools. Together these reasons accounted for 50.91 per cent of the non-attendance in Sudanese schools. The proportion of respondents who had ever attended school was 66.57 per cent. Northern state had the highest rate of those who had ever attended school, while Central Darfur state had the lowest. About 30.8 per cent of the localities had fewer than 50 per cent of respondents who had ever attended school.

Child protection: For child protection, it is important to look at both early marriage and pregnancy. In terms of the prevalence of early marriage, it was 60.19 per cent nationally, of which 26.55 per cent were marriages before 15 years of age. South Darfur had the highest prevalence of early marriage at 80.54 per cent, while Northern state had the lowest at 33.22 per cent. One consequence of early marriage is early pregnancy (or early parity, i.e., giving birth before the age of 19); the prevalence in Sudan continued to be high at 72.01 per cent. Blue Nile state had the highest prevalence of early pregnancy (80.12 per cent), while Northern state had the lowest prevalence (61.4 per cent). Among girls 14 years and below, the rate of FGM was 27.18 per cent across Sudan. Red Sea state had the highest prevalence at 61.52 per cent, while West Darfur had the lowest prevalence at 8.15 per cent. In Sudan, 60.37 per cent of the population had a birth certificate. Among states, Northern state had the highest proportion of registered births and birth certificates at 98.44 per cent, while Central Darfur state had the lowest at 12.25 per cent.

Child health insurance: The percentage of children with child health insurance was only 23.36 per cent across Sudan. The majority of covered children were from Northern state (42.36 per cent), while Al-Gazeera state had the lowest percentage (13.18). Among localities, only 2.2 per cent had health insurance coverage of children above 50 per cent.

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0. KEY FINDINGS

0.1 Child nutritional status

Child nutritional status includes the nutritional status indicators for the growth including:

- **Stunting:** height-for-age Z-scores[23] (HAZ)/height for age < –2 SD/ of the WHO Child Growth Standards median.
- **Underweight:** weight for age < –2 standard deviations (SD) of the WHO Child Growth Standards median.
- **Wasting:** weight-for-height Z-score (WHZ) < –2 SD of the WHO Child Growth Standards median.
- **Overweight:** weight for height > +2 SD of the WHO Child Growth Standards median.

In addition to these growth measurements, the following tests check for child nutritional status:

- **Oedema:** bilateral pitting oedema is measured by observable swelling of body tissue due to fluid accumulation that may be demonstrated by applying pressure to the swollen area.
- **Haemoglobin blood test for anaemia:** A haemoglobin test is done to check for low or high levels of red blood cells. It can be done as part of a routine checkup to screen for problems and/ or because a child is not feeling well. When the level of red blood cells is low, it is called anaemia.

Stunting prevalence

Stunting is the result of long-term nutritional deprivation and often results in delayed mental development, poor school performance and reduced intellectual capacity. The national prevalence of stunting[24] was 36.35 per cent, of which moderate stunting was at 21.25 per cent, while severe stunting was at 15.06 per cent. A great variability was noted across states, and 47 per cent of localities had stunting greater than 40 per cent.

Underweight prevalence

As weight is easy to measure, this is the indicator for which the most data has been collected historically. Evidence has shown that children who are even mildly underweight have a heightened risk of mortality, while severely underweight children are at even greater risk. Underweight prevalence across the country was 29.16 per cent, of which the prevalence of moderate underweight was 21.14 percent and severe underweight was 7.93 per cent. Across states and localities, the range was between 20.9 per cent to 44.3 per cent.

Wasting by mid-upper-arm circumference (MUAC)

Wasting in children is a symptom of acute undernutrition, usually as a consequence of insufficient food intake or a high incidence of infectious diseases, especially diarrhoea. Wasting impairs immune system functioning, which heightens susceptibility to infectious disease, can lengthen the duration of an illness and also increase the risk of death. The national level of wasting, as determined using MUAC measures, was at 9.5 per cent, with moderate wasting at 7.63 per cent and severe wasting at 1.76 per cent. Across states, the prevalence of global wasting was highest in Red Sea state, at 29.6 per cent, while Khartoum state had the lowest (5.24 per cent).

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[23] Z-score (or SD-score) = (observed value - median value of the reference population) / standard deviation value of reference population

[24] Stunting is the impaired growth and development that children experience from poor nutrition, repeated infection and inadequate psychosocial stimulation. Children are defined as stunted if their height-for-age is more than two standard deviations below the WHO child growth standards median.

Wasting by weight-for-height Z-score (WHZ)

Prevalence of severe wasting, as determined by weight-for-height Z-score (WHZ), was at 2.72 per cent throughout the country. Red Sea state had the highest prevalence rate of WHZ wasting, at 10.95 per cent, while Blue Nile state had the lowest rate, at 0.92 per cent. Among localities, 56 of the 185 localities had a severe acute malnutrition rate, defined as WHZ wasting prevalence of over 3 percent.

There are new prevalence thresholds[25] for wasting.[26] A child who is moderately or severely acutely malnourished (wasted) has an increased risk of death, but treatment is possible. The prevalence ranges are used to monitor the nutritional status of children under 5 years of age, helping prioritize resources and plan relevant nutrition programs. The updated thresholds were prompted by three key developments:

1) The WHO child growth standards in 2006 changed survey estimates compared to the previously used international growth reference.

2) The labels used to refer to the prevalence categories across stunting, wasting and overweight had to be harmonized.

3) There was a need to develop prevalence ranges for overweight children.

New prevalence thresholds for stunting, wasting and overweight in children (UNICEF)

Labels	Prevalence Thresholds % Wasting	% Overweight	% Stunting
Very Low	<2.5	<2.5	<2.5
Low	2.5-< 5	2.5-< 5	2.5-< 10
Medium	5-< 10	5-< 10	10-< 20
High	10-< 15	10-< 15	20-< 30
Very High	³15	³15	³30

- *Source: United Nations Children's Fund, 'New Prevalence Thresholds for Stunting, Wasting and Overweight in Children', UNICEF: Working to Improve Nutrition at Scale, issue 24, 13 December 2018, <https://us14.campaign-archive.com/?e=%5bUNIQID%5d&u=fb1d9aabd6c823bef179830e9&id=c74c174635>,accessed September 26, 2019.*
- *Onis, Mercedes de, et al., 'Prevalence Thresholds for Wasting, Overweight and Stunting in Children under 5 Years,' Public Health Nutrition, vol. 22, no. 1, 1 January 2019, pp. 175–179, < https://doi.org/10.1017/S1368980018002434>.*

Severe acute malnutrition (SAM) prevalence by mid-upper-arm circumference (MUAC)

Severe acute malnutrition (SAM) is the most extreme and visible form of malnutrition. Children with severe acute malnutrition have very low weight for their height and severe muscle wasting. They may also

[25] Thresholds were developed in relation to standard deviation of the normative WHO Child Growth Standards. The proposed thresholds minimize changes and keep coherence across anthropometric indicators. They can be used for descriptive purposes to map countries according to severity levels; by donors and global actors to identify priority countries for action; and by governments to trigger action and target programmes aimed at achieving 'low' or 'very low' levels.

[26] Onis, Mercedes de, et al., 'Prevalence Thresholds for Wasting, Overweight and Stunting in Children under 5 Years', *Public Health Nutrition*, vol. 22, no. 1, 1 January 2019, pp.175–179, <https://doi.org/10.1017/S1368980018002434>.

have nutritional oedema – characterized by swollen feet, face and limbs.[27] The terms acute malnutrition and wasting should not be used interchangeably.[28] The percentage of children suffering from SAM, as measured by MUAC, was at 1.76 per cent across the country. Red Sea state had a significantly higher prevalence rate of SAM at 8.5 per cent, while Northern state had the lowest at 0.69 per cent. Among specific localities, there was a markedly higher prevalence of SAM in El Ganab Elawlaib (10.13 per cent), Sinkat (11.24 per cent), and Tokar (14.97 per cent) localities in Red Sea state.

Childhood obesity prevalence

Across the country, prevalence of obese children was 0.85 per cent, and prevalence of overweight children was 2.14 per cent. Al-Gadarif state had the highest prevalence of overweight children (4.33 per cent) and obese children (1.74 per cent). Relatively higher rates of obesity were also found in some areas in Red Sea, Northern, Sennar, Blue Nile and Darfur states as shown in the raster maps.

Oedema prevalence

Child nutrition oedema prevalence across the country was low, at 0.18 percent. Among states, West Darfur (0.69 per cent) and North Darfur (0.66 per cent) had a high prevalence of nutrition oedema relative to others.

Anaemia prevalence

Prevalence of anaemia among children was 48.09 per cent for the entire country, with mild anaemia 23.72 per cent and moderate anaemia 22.52 per cent. Severe anaemia was significantly less at 1.68 per cent. Across states, 33.3 per cent had more than 50 per cent of children with anaemia. East Darfur state had the highest prevalence of anaemic children (66.44 per cent), while West Darfur had the lowest (32.99 per cent).

0.2 Infant and young child feeding (IYCF)

Exclusive breast-feeding

The national exclusive breast-feeding rate was 62.31 per cent. Age-appropriate continued breast-feeding up to 2 years of age or beyond was 73.29 per cent, age-appropriate meal frequency was 63.24 per cent, and age-appropriate dietary diversity was 25.40 per cent. Moderate and high rates of all IYCF indicators were near-evenly distributed throughout Sudan.

Complementary feeding

The infant and child feeding index (ICFI), an age-specific composite index, can be used to assess complete feeding practices for infants and young children. Among children from 6-23 months, the average ICFI score was 3.75 out of 6 and a 'good' IYCF among children from 0-23 months was 22.33 per cent. For complementary feeding, 78.59 per cent of children 6 – 8 months were introduced to solid or semi-solid foods and 43.22 per cent had a 'good' IYCF score *(see page 98)*. The ICFI score is based on three variables: breast-feeding, dietary diversity, and the meal frequency. At the state level, complementary feeding indicators were relatively high, with very small inter-state variability.

Child consumption of protein-rich foods

Child consumption of protein-rich foods was low at 28.85 per cent overall, with 24.36 per cent consuming protein from animal sources and 6.66 per cent consuming protein from plant sources. About 82.7 per cent of the localities had less than 50 per cent of children who consumed protein-rich foods in the day prior to the survey.

[27] United Nations Children's Fund, 'Severe Acute Malnutrition', UNICEF, 23 December 2015,. <www.unicef.org/nutrition/index_sam.html>, accessed January 14, 2020.

[28] Frison, Severine, Francesco Checchi and Marko Kerac, 'Omitting Edema Measurement: How Much Acute Malnutrition Are We Missing?', *The American Journal of Clinical Nutrition,* vol. 102, no. 5, 1 November 2015, pp. 1176–81, <https://doi.org/10.3945/ajcn.115.108282>.

Child consumption of vitamin A-rich foods

Child consumption of vitamin A-rich foods from any source was low at 23.44 per cent, with 19.02 per cent of children getting it from animal sources and 6.56 per cent getting it from plant sources. 87.1 percent of localities had less than 50 per cent of children who consumed vitamin A-rich foods in the day prior to the survey, while 20 per cent of the localities had no children who consumed vitamin A-rich food at all in that period.

Child consumption of iron-, calcium- and zinc-rich foods

The proportion of children who consumed iron-, calcium-, and zinc-rich foods was low at 12.28 per cent, 17.62 per cent, and 14.99 per cent respectively. There was little variability across states and localities.

Child consumption of vitamin B-rich foods

There was also an overall low child consumption of vitamin B-rich foods, with a few localized areas of high consumption scattered across the country (see page 165). Consumption of vitamin B1-, B2-, and B3-rich foods were 28.76 per cent, 30.69 per cent, and 14.97 per cent respectively.

Child consumption of vitamin B6-, B12-, and B complex-rich foods was low at 18.83 per cent, 25.78 per cent, and 11.02 percent respectively. At the state and locality level, the picture remained similar, with small variability between states.

Coverage of growth monitoring promotion (GMP) and screening and infant and young child feeding (IYCF) counseling

Low coverage of MUAC screening and GMP screening was nearly even throughout Sudan at 6.03 per cent and 7.55 per cent respectively, with very small areas of moderate coverage in Red Sea state. Coverage of IYCF counseling was moderate at 38.36 per cent.

Vitamin A supplementation coverage for children

Coverage of vitamin A supplementation in children was low at 39.79 per cent for the past six months. Some areas with significantly high coverage of vitamin A supplementation included the southern parts of Red Sea state, Kassala state, Blue Nile state, central part of Khartoum state, southern part Kordofan state, and parts of North Darfur state. Only 34 per cent of localities achieved coverage greater than 50 per cent.

0.3 Maternal nutrition

Maternal nutritional status

Prevalence of GAM among reproductive-age women (15-49 years of age) was relatively low, with a range of 4.6-18.15 percent and an average of 8.63 per cent. Maternal MAM was 6.36 per cent and maternal SAM was 2.18 per cent. Red Sea state had a significantly higher prevalence of GAM than other states at 18.15 per cent, while Khartoum state had the lowest prevalence at 4.6 per cent. The highest rate of SAM was in Kassala state at 3.76 per cent, and the lowest rate of SAM was in West Darfur at 0.67 per cent.

Women's protein consumption

Consumption of protein-rich foods (from both animal and plant sources) among reproductive-age women (15-49 years of age) was high at 82.82 per cent, and protein came predominantly from animal sources. A decreasing trend in consumption of protein-rich foods was observed from the eastern to the western parts of the country.

Women's dietary diversity

The average diet in terms of dietary diversity for reproductive-age women (15-49 years of age) across Sudan- evaluated for quality and quantity and measured by the women's dietary diversity score (WDDS) - was low at 2.95 food groups.[29] Khartoum state had the highest mean WDDS of 3.55 food groups, while East Darfur state had the lowest of 1.79 food groups.

Women's vitamin A-rich food consumption

The level of consumption of vitamin A-rich foods for reproductive-age women was found to be moderate at 67.36 per cent, with the greater part coming from animal sources. Across states there is great variability: high levels of vitamin A intake were noted in North and South Darfur, while East Darfur state had the lowest vitamin A-rich food consumption from any source.

Women's consumption of iron-, calcium- and zinc- rich foods

Consumption of iron-rich foods was relatively high among reproductive-age women (15-49 years of age) at 66.75 per cent. Across states, 44.4 per cent had more than 70 per cent of surveyed carers who consumed iron-rich foods. Blue Nile had the highest proportion, while Red Sea state and parts of North and East Darfur had the lowest proportion.

Consumption of calcium-rich foods was relatively low among reproductive-age women (15-49 years of age) at 47.69 per cent. Of all the states, only one had more than 70 per cent of carers consuming calcium-rich foods. Kassala state had the highest proportion, while Blue Nile state had the lowest.

Consumption of zinc-rich foods was relatively low among reproductive-age women (15-49 years of age) at 69.72 per cent. Across states, 50 per cent had more than 70 per cent of carers who consumed zinc-rich foods. The highest proportion of zinc-rich food consumption was in Blue Nile state.

Women's consumption of vitamin B-rich foods

Consumption of vitamin B-rich foods was generally high among reproductive-age women at 62.13 per cent, though only 33.3 per cent of states had more than 70 per cent of carers consuming vitamin B-rich foods. A considerable inter-state variability was observed for this variable. Al-Gazeera state had the highest proportion of vitamin B-rich food consumption, while East Darfur state had the lowest. Vitamin B-rich food consumption was particularly poor in some areas of Red Sea, Kassala, West Kordofan state and parts of Darfur state.

0.4 Salt iodization

Household use of adequate amounts of iodized salt has declined substantially since the last national survey. In only three localities did the use of iodized salt reach 50 per cent or higher.

0.5 Female genital mutilation (FGM) among adult women

Prevalence of female genital mutilation (FGM) among carers was still high at 83.87 per cent. In North Kordofan, state the proportion of carers who experienced FGM at different ages was 97.74 per cent, while Central Darfur and West Darfur states had the lowest prevalence of FGM.

0.6 Childhood illnesses

Recognition of danger signs

The study shows that the mean number of common child health danger signs that carers were able to identify was very poor at 1.67 signs out of 5 signs. Across states and inter-states, average recognition

[29] 'Minimum Dietary Diversity – Women', Food and Nutrition Technical Assistance Project/FHI 360

of these signs ranged from 0.86 to 2.01. Of all danger signs, fever was the most commonly recognized by carers at 81.84 per cent.

Prevalence and treatment of diarrhoea

Prevalence of diarrhoea among children during the survey period was 23.98 per cent, with a few confined areas of high prevalence spread throughout the country. For children who experienced diarrhoea over the two weeks prior to the survey, only in 62.87 per cent of cases did the carer visited a health facility.

Prevalence and treatment of acute respiratory infection (ARI)

Prevalence of acute respiratory infection (ARI) among children in the two weeks prior to the survey was 23.73 per cent for the country. South Kordofan state had the highest period prevalence of ARI, and Northern state had the lowest prevalence. Of the children who experienced ARI in the previous two weeks, 70.10 per cent visited a health facility, and of these 74.72 per cent were provided with treatment for the ARI.

Prevalence and treatment of fever

Prevalence of fever during the survey period was 23.13 per cent. The highest registered period prevalence of fever was in South Darfur state, and the lowest prevalence was in Northern state.

0.7 Antenatal care (ANC) and postnatal care coverage

Time of first ANC visit

The S3M II results revealed that women throughout the country made their first antenatal care (ANC) visit relatively late at 3.44 months into gestation. The earliest ANC visits were in Northern state at 2.7 months into gestation on average. Some localities in South Darfur and Red Sea had the latest visits of all at an average 6 months and 6.65 months into gestation respectively.

Number of ANC visits

Survey results indicated that on average, pregnant women in Sudan attended 3.77 ANC visits during their pregnancy.

Attendance of at least four ANC visits

Throughout the whole of Sudan, 51.24 per cent of pregnant women made four or more ANC visits. Khartoum state had the highest attendance rate, with 79.63 per cent of expectant mothers attending four or more ANC sessions. Central Darfur state had the lowest attendance, with only 21.98 per cent of mothers attending four or more ANC sessions. In the specific localities of Sharg El Jabal (accessible parts) and North Jebel Mara, no expectant mother attended four or more ANC visits during their last pregnancy.

Non-attendance to ANC visits

Non-attendance to ANC visits was relatively high according to the survey at 16.2 per cent. Among the states, Central Darfur had the highest rate of ANC non-attendance (46.64 per cent), while Northern state had the lowest (4.94 per cent). Some specific localities had particularly high attendance problems: 17 localities had ANC non-attendance rates above 40 per cent, most them in Central Darfur (five localities) and South Darfur (five localities), West Darfur, (two localities) with the remaining localities in Al-Gadarif, Blue Nile, East Darfur and Red Sea states. The lowest rate of ANC non-attendance was in rural Khashm Elgirba locality in Kassala state at 1.25 per cent.

Postpartum care coverage

Poor postpartum care coverage was verified across the country at only 34.2 per cent of mothers served. Northern state had the highest rate of postpartum care at 64.74 per cent, while Central Darfur state had the lowest coverage at 7.89 per cent. Great variability was noted among localities. Some localities

inside Red Sea state had postpartum coverage as high as 86.42 per cent, while several localities in South Darfur, Central Darfur and East Darfur had post-partum coverage of less than 10 per cent.

Vitamin A supplementation

Vitamin A supplementation among lactating women was low, with 48.1 per cent of localities showing coverage of less than 15 per cent.

Postpartum night blindness

Postpartum self-reported night-blindness was 13.04 per cent across the country.

Tetanus vaccination

Tetanus vaccination coverage was relatively high at 67.34 per cent. The highest prevalence, at 85.01 per cent, was in Khartoum state while the lowest was in Central Darfur state at 38.02 per cent. Across localities, prevalence ranged from 93.47 per cent coverage in South Darfur to 4.24 per cent in Red Sea state.

0.8 Health services

Coverage of expanded programme on immunization (EPI)

The expanded programme on immunization (EPI) forms the foundation of global public health action for child survival and disease prevention. The availability of a child vaccination card and coverage of Bacillus Calmette-Guerin (BCG), the vaccine used against tuberculosis, are good proxies for initial access to EPI services.

Access to EPI services and vaccination cards

The percentage of children below 24 months who had a vaccination card was 61.74 per cent. Only 11.9 per cent of the localities had 80 per cent or higher of children below 24 months with vaccination cards.

Bacillus Calmette-Guerin (BCG) vaccine coverage

BCG coverage for children below 12 months of age was 77.58 per cent. Blue Nile state had the highest coverage, while Central Darfur state had the lowest coverage. Only in 48.1 per cent of the localities did 80 per cent or more of children younger than 12 months receive a BCG vaccination.

Pentavalent vaccine coverage

Pentavalent vaccination coverage for children younger than 12 months was 75.98 per cent for the first dose; a substantial drop in coverage was verified for the third dose at only 59.04 per cent; this is equivalent to a drop-out rate of 16.94 per cent. In 43.2 per cent of localities did at least 80 per cent of children younger than 12 months receive the first dose of the pentavalent vaccination.

Polio vaccine coverage

Oral polio vaccine coverage for children 0-12 months was relatively high for the first dose at 72.66 per cent, but only 56.86 per cent received the third dose; this showed a drop-out rate of 15.8 per cent. In only 31.4 per cent of the localities did 80 per cent of children 0-12 months receive the first dose of oral polio vaccine.

Measles vaccine coverage

Measles vaccine coverage for children 0-12 months old was low at 28.5 per cent for the first dose.

Full EPI coverage

The proportion of children from 0-12 months old across Sudan who received full EPI coverage was 26.74 per cent. Khartoum state had the highest full EPI coverage, while North Kordofan state had the lowest coverage. None of the localities had at least 80 per cent of children with full EPI coverage.

Time to reach a health facility

In the survey, 63.99 per cent of carers said that they could access a health facility within 30 minutes. The average time needed to reach the nearest health facility across states ranged from 0.42 to 1.6 hours. Most carers also affirmed that when they visit the nearest health facility, they were attended to by a community health worker, medical assistant or midwife.

Coverage of insecticide-treated nets

The proportion of children under age 5 who reportedly slept under an insecticide-treated net (ITN) the night before the survey was 38.48 per cent. Blue Nile state had the highest proportion of children sleeping under ITNs, while Red Sea state had the lowest. Of localities, only 42.7 per cent of localities achieved greater than 50 per cent coverage in ITN utilization.

0.9 Carer health awareness, strategies and communications

Awareness of growth monitoring programme (GMP)

Awareness of the GMP was only 42.23 per cent across the country. North Kordofan had the highest level of awareness of GMP at 69.6 per cent, and Central Darfur had the lowest awareness at 16.79 per cent. A large number of localities (72.4 per cent) had less than 50 per cent awareness of GMP, and in some localities in South and Central Darfur, carers reported 0 per cent awareness of the GMP.

Awareness of community management of acute malnutrition (CMAM) programmes

Awareness of a CMAM programme was 53.74 per cent throughout the country. Among states, awareness of CMAM ranged from 85.3 per cent to 37.08 per cent. High variability was noted among localities, with almost 0 per cent awareness in some localities in South Darfur.

Coverage of health and nutrition messages

According to the survey, 46.75 per cent of carers reported receiving health and nutrition messages. There was great variability of communication coverage between states, with coverage ranging from 24.0 per cent to 75.51 per cent. Some carers in East and South Darfur state reported that they had never received a single health and nutrition message.

Carers' preferences for health and nutrition communication channels

Outreach workers were the most preferred source of health and nutrition messages by 34.65 per cent of carers across the country, followed by radio (21.2 per cent) and then television broadcasting (19.73 per cent). The Sudan TV channel was cited as the most popular television channel, preferred by 7.87 per cent of all caregivers, and the Sudan National radio station was the most popular radio station, preferred by 8.72 per cent of all caregivers. Mornings and evenings were the preferred times to receive communications by 16.85 per cent and 17.28 per cent of caregivers respectively.

Coping strategies index scores

Among households across Sudan, 2.19 per cent of households were found to have low coping strategies index (CSI) scores, 3.39 per cent had moderate CSI scores, and 12.21 per cent had high CSI scores.

0.10 Water, sanitation, and hygiene (WASH)

Drinking water access

The proportion of households with access to improved sources of drinking water was 83.03 per cent across Sudan. On average 73.73 per cent of households had access to basic drinking water sources within 30 minutes of their home.

Sanitation access

The proportion of households with access to improved toilet facilities (shared or non-shared) was low at only 37.4 per cent, and 2.1 per cent of localities had no access to improved toilet facilities at all. Households in Northern state had the highest access to toilet facilities, while South Kordofan had the lowest access. On the other hand, the proportion of households practicing open defecation was 33.12 per cent, and Red Sea state had the highest level of open defecation (70.02 per cent).

Handwashing awareness

Only 7.37 per cent of carers were able to identify all key handwashing events needed (before eating, before preparing food, after defecation, after cleaning child, and before child feeding). Handwashing before eating was the most commonly identified event. In about 16.8 per cent of localities, none of the carers were able to identify all five handwashing events.

0.11 Education

Access to basic education

Across Sudan, 80.74 per cent of all children had access to basic education, with males having slightly more access (81.95 per cent) than females (79.57 per cent). Very low access to education was verified in some areas in Red Sea, Kassala, Central Darfur, and South Darfur states. More than 50 per cent of children had access to basic education in about 90.8 per cent of localities.

Access to preschool or basic education

The proportion of children with access to preschool or basic education was 72.13 per cent, with males at 73.0 per cent and females at 71.53 per cent. Across states, Northern state was leading in terms of access to education, while in West Darfur and Central Darfur states, children had less access to education. More than 50 per cent of children had access to preschool or basic education in about 76.8 per cent of localities.

Reasons for not attending school

The most common reasons given for children not attending school were related to fees, followed by distance to school and unavailable schools. Together these reasons accounted for 50.91 per cent of non-attendance in schools in Sudan.

Proportion of people who ever attended school

The proportion of respondents who had ever attended school was 66.57 per cent. Northern state had the highest proportion of those who had ever attended school, while Central Darfur state had the lowest. About 30.8 per cent of the localities had fewer than 50 per cent of respondents who had ever attended school.

0.12 Child protection

Early marriage

The prevalence of early marriage (at or below 18 years) was 60.19 per cent across the whole country, of which 26.55 per cent were marriages before 15 years of age. South Darfur had the highest prevalence of early marriage at 80.54 per cent, while Northern state had the lowest at 33.22 per cent.

Early pregnancy

One of the consequences of early marriage is early pregnancy (or early parity, i.e., giving birth before the age of 19). The prevalence in Sudan continued to be high at 72.01 per cent. Blue Nile state had the highest prevalence of early pregnancy (80.12 per cent), while Northern state had the lowest prevalence (61.4 per cent).

Female genital mutilation (FGM) among girls

In the survey, the prevalence of child FGM (14 years and below) was 27.18 per cent across Sudan. Red Sea state had the highest prevalence at 61.52 per cent, while West Darfur had the lowest prevalence at 8.15 per cent.

Birth registration and birth certificates

60.37 per cent of the population of Sudan had a birth certificate. Among states, Northern state had the highest proportion of registered births and birth certificates at 98.44 per cent, while Central Darfur state had the lowest at 12.25 per cent.

Child health insurance

The rate of child health insurance coverage was 23.36 per cent across Sudan. The largest percentage of children covered was Northern state (42.36 per cent), while Al-Gazeera state had the lowest percentage (13.18) of children with health insurance. Among localities, in only 2.2 per cent had were more than than 50 per cent of children covered by insurance.

CHAPTER 1

INTRODUCTION OBJECTIVES

1. INTRODUCTION

Current nutrition situation in Sudan

Sudan has the third-highest prevalence of acute malnutrition in the world and the highest in the Middle East and North Africa region, with16 per cent global acute malnutrition (GAM) among children under five years. The under-five mortality rate in the country was estimated at 68/1000 in 2014 compared with 108/1000 in 2000, for an annual rate of reduction of 2.2 per cent since 1990. Access to Primary Health Care (PHC) remains low despite the fact that the Integrated Management of Childhood Illnesses (IMCI) coverage at health facilities increased from 43 per cent to 46.1 per cent in 2013. Sudan's low coverage of improved water and sanitation facilities continues to hamper overall child health and nutrition.

Simple spatial survey method (S3M) background and methodology

The S3M is a large-scale survey method originally developed from the Centric Systematic Area Sampling (CSAS) coverage survey method[30] as a response to the widespread adoption of CMAM by ministries of health. From its initial application as a coverage survey method, S3M's potential for use in national-scale, multi-indicator surveys was considered and explored. Sudan supported the development of the method for this broader application through two state-level pilots, in Gedaref and Sennar states in 2012, which eventually led to the first national S3M survey in Sudan in 2013 (Sudan National S3M I, 2013).

The goal of S3M I was to measure a range of indicators (health, WASH and nutrition) over small geographical areas, providing results at the locality level and lower. It provided comprehensive information at the state and locality levels, which was used to target and realign interventions. The experience from the *Sudan S3M I* (2013) has shown that mapping variation, and thus identifying areas of high need, has allowed evidence-based, cost-effective targeting of interventions to the most vulnerable populations. This is particularly valuable in the current context of diminishing funding resources in Sudan, as it improves cost-benefit analysis and decision making with limited resources. The *S3M I* contributed to planning of humanitarian and other responses to target the most vulnerable communities at the locality level and below over the last two to three years in Sudan.

For instance, the results were used for the mid-year revision of the *2014 Humanitarian Needs Overview* (HNO) for all sectors. *S3M I* data enabled, for the first time, the use of locality-level information for targeting responses and also acted as a catalyst for multisectoral programming. In addition, the *S3M I* survey results contributed to establishing the UNICEF programmatic shift to intervening in high-priority localities and it also helped the Government of Sudan to prioritize localities most in need.

A second survey following a similar methodology, the S3M II, has been carried out in 2018 in order to obtain updated and comprehensive data for health, nutrition, WASH, child protection, education and food security indicators. It includes data for smaller geographical areas within localities inside Sudan, as well as from the national, state and locality level, and it focuses on children and their mothers. It intends to identify the areas of highest need to enable evidence-based programme planning, targeting for equity, and a better and more effective use of scarce resources for humanitarian response and enhanced impact within Sudan.

[30] Myatt et al., *Field Trial Estimating Selective Feeding Programme Coverage*

Objective of S3M II

The general objective of carrying out the S3M II is to obtain reliable estimates for key nutrition and other child survival indicators at a disaggregated level, in order to contribute to situation analysis and various sectors' programme planning and monitoring in the country. A secondary objective is to compare the results of the S3M II to the S3M I carried out in 2013, in order to integrate the data over time and compare changes and trends in the data over time.

Strategic objectives of this report

- To document the process and the results of S3M II for the whole of Sudan.
- To report on data for health, nutrition, WASH, child protection, education and food security indicators for small areas (at sub-locality level) for children and their mothers in Sudan.
- To map results to show geographic areas of highest need and 'hot-spots'.
- To provide an evidence base for prioritization of existing interventions in health, nutrition WASH, child protection, education and food security, and to advocate for the well-being of women and children in Sudan.
- To enable monitoring of trends at national state and locality level, and to compare results between the two S3M surveys to monitor progress and change against the baseline

CHAPTER 2

METHODS

2. METHODOLOGY

2.1 The simple spatial sampling method (S3M) sample

The survey was designed to be spatially representative of the whole country, including its smaller administrative units up to the locality level, except for few inaccessible areas. An even distribution of primary sampling units (PSUs) (i.e., villages/city blocks) was selected from across the country. This approach was used as it is most suited to assessing indicators over wide areas to detect and map heterogeneity of indicators, which is the primary objective of this national survey.[31] [32] [33] PSUs (i.e. villages/city blocks) were selected based on their proximity to centroids of a hexagonal grid laid over the entire country. The resulting sample is a triangular irregular network. [34] [35] A variable density sampling approach[36] was used to achieve a sample that draws a minimum number of PSUs from localities and from urban areas so that they can provide estimates for each of these areas with useful precision.

A sample of up to n = 32 mother and child pairs in m = 3027 PSUs was taken *(see Figure 1)*. Across Sudan, a total of 93,882 households and 145,002 children below 5 years of age were surveyed.

Selected primary sampling units (PSUs)

The map-segment-sample approach was used for within-community sampling of PSUs. In this approach, PSUs organized as ribbon/s of dwellings *(see Figure 3)* were sampled systematically, while those organized as clusters of dwellings *(see Figure 2)* were sampled using a random walk EPI3 strategy (Bennett et al.1994).

FIGURE 1: Sampled settlements across Sudan (m = 3027)

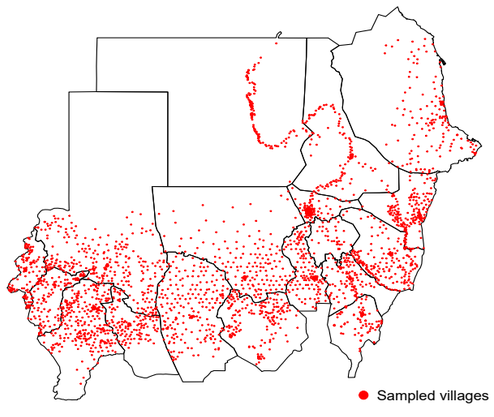


FIGURE 2:
Example of a cluster of dwellings

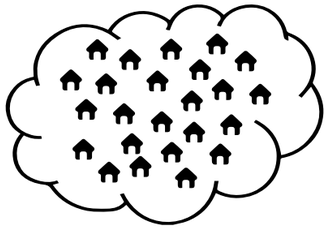


FIGURE 3:
Example of a ribbon of dwellings

[31] Gilbert, Richard O., *Statistical Methods for Environmental Pollution Monitoring*, 1st ed., Wiley, New York, 1987.

[32] Elliott, P., et al., eds., *Spatial Epidemiology: Methods and Applications,* 1st ed., Oxford University Press, Oxford, 2001.

[33] Pfeiffer, Dirk, *Spatial Analysis in Epidemiology,* Oxford University Press, Oxford and New York, 2008.

[34] Ibid.

[35] Isaaks, Edward H., and R. Mohan Srivastava, *Applied Geostatistics,* Oxford University Press, Oxford,1989.

[36] Isaaks, Edward H., and R. Mohan Srivastava, *An Introduction to Applied Geostatistics*, 1st. ed., Oxford University Press, New York, 1990.

2.2 Indicators

Below are the lists of indicators assessed during the S3M II survey.

Child nutritional status indicators			
Indicator	**Definition**	**Numerator**	**Denominator**
Wasting Global (MUAC)	Percentage of children 6–59 months with a MUAC <125mm and or oedema	Number of children 6–59 months with a MUAC <125mm and or oedema	Total number of children aged 6–59 months
Wasting MODERATE	Percentage of children 6–56 months with a MUAC <125 mm-=>115mm	Number of children 6–56 months with a MUAC <125 mm-=>115mm	Total number of children aged 6–59 months
Wasting SEVERE (MUAC)	Percentage of children 6–59 months with a MUAC <115	Number of children 6–59 months with a MUAC <115	Total number of children aged 6–59 months
Wasting Global (WHZ)	Percentage of children 6–59 months<-2 Z-scores weight for height and/or oedema	Number of children 6–59 months<-2 Z-scores weight for height and/or oedema	Total number of children aged 6–59 months
Wasting MODERATE (WHZ)	Percentage of children 6–59 months<-2 Z-scores for height and =-3 z-scores weight for height	Number of children 6–59 months<-2 Z-scores for height and =-3 z-scores weight for height	Total number of children aged 6–59 months
Wasting SEVERE (WHZ)	Percentage of children 6–59 months <-3 Z-scores weight for height and/or oedema	Number of children 6–59 months <-3 Z-scores weight for height and/or oedema	Total number of children aged 6–59 months
Underweight GLOBAL	Percentage of children 6-59 months <-2 Z-scores weight for age	Number of children 6-59 months <-2 Z-scores weight for age	Total number of children aged 6-59 months
Underweight MODERATE	Percentage of children 6–59 months <-2 Z-scores weight for age and =>3 Z-scores weight for age	Number of children 6–59 months <-2 Z-scores weight for age and =>3 Z-scores weight for age	Total number of children aged 6–59 months
Underweight SEVERE	Percentage of children 6–59 months<-2 Z-scores height for age	Number of children 6–59 months<-2 Z-scores height for age	Total number of children aged 6–59 months
Stunting/ Stuntedness	Percentage of children 6–59 months <-2 Z-scores height for age and =>-3Z-scores height for age	Number of children 6–59 months <-2 Z-scores height for age and =>-3Z-scores height for age	Total number of children aged 6–59 months
Stunting/ Stuntedness SEVERE	Percentage of children 6–59 months <-2 Z-scores height for age and =-3 Z-scores height for age	Number of children 6–59 months <-2 Z-scores height for age and =-3 Z-scores height for age	Total number of children aged 6–59 months
Overweight / Obesity	Percentage of children 6–59 months > 2 Z-scores weight for height /age	Number of children 6–59 months > 2 Z-scores weight for height /age	Total number of children aged 6–59 months

Anaemia prevalence indicators			
Indicator	**Definition**	**Numerator**	**Denominator**
Haemoglobin	Percentage of any/mild/ moderate/severe anaemia among children 6–59 months of age	Number of children 6–59 months of age with HB levels in (different ranges)	Total number of children 6–59 months of age

Infant and young child feeding indicators			
Indicator	**Definition**	**Numerator**	**Denominator**
Good Infant and Young Child Feeding (IYCF)	Percentage of children aged 0–24 months receiving the recommended infant and young child feeding practices	Number of children aged 0–24 months receiving the recommended infant and young child feeding practices	Total number of children aged 0–24 months
Exclusive Breast-feeding	Percentage of children 0–6 months taking breast milk only	Number of children 0–6 months taking breast milk only	Total number of children aged 0–6 months
Infant and Young Child Feeding Index	Average child feeding score among children 6–24 months	-	-
Continuing Breast-feeding	Percentage of children 6–24 months currently breast–feeding	Number of children 6–24 months currently breast–feeding	Total number of children aged 6–24 months
Introduction of Complementary Foods	Percentage of infants 6–8 months who receive solid, semi–solid or soft foods	Infants 6–8 months who received solid, semi–solid or soft foods during the previous day	Infants 6–8 months
Meal Frequency Diagnostic	Percentage of children receiving meals the appropriate number of times for their age during the 24 hours before the survey	Number of children receiving meals the appropriate number of times for their age during the 24 hours before the survey	Total number of children aged 0–59 months
Child Dietary Diversity	Percentage of children consuming the appropriate number of food groups for their age during the 24 hours before the survey	Number of children consuming the appropriate number of food groups for their age during the 24 hours before the survey	Total number of children aged 0–59 months

MUAC screening coverage indicator			
Indicator	**Definition**	**Numerator**	**Denominator**
MUAC Screening Coverage	Percentage of children 6–59 months having their MUAC measured during the past 3 months	Number of children 6–59 months having their MUAC measured in the past three months	Total number of children aged 6–59 months

Child vitamin A supplementation coverage indicator			
Indicator	**Definition**	**Numerator**	**Denominator**
Vitamin A Supplement Received	Percentage of children 6–59 months who received vitamin A supplementation in the 6 months prior to the survey	Numbers of children 6–59 months who received vitamin A supplementation in the 6 months prior to the survey	Total number of children aged 6–59 months

Maternal nutrition status indicator			
Indicator	**Definition**	**Numerator**	**Denominator**
Principal Carer Undernourished (MUAC <230 mm)	Percentage of principal carers with a MUAC less than 230 mm	Numbers of principal carers with a MUAC less than 230 mm	Total number of principal carers

Women's diet indicators			
Indicator	**Definition**	**Numerator**	**Denominator**
PCs Dietary Diversity Score	The average number of food groups eaten by PCs during the 24 hours before the survey	Number of food groups eaten by PCs during the 24 hours before the survey	Total number of PCs

Salt iodization indicator			
Indicator	**Definition**	**Numerator**	**Denominator**
Adequately Iodized Salt	Percentage of households with a sample of salt tested as containing equal to or more than 15 parts per million of iodate	Numbers of households with a sample of salt tested as containing equal to or more than 15 parts per million of iodate	Total number of households

Recognition of danger signs indicator			
Indicator	**Definition**	**Numerator**	**Denominator**
Danger Signs Known by the Principal Carer for U-5 Children	Average number of illness danger signs listed by principal carers	NA	NA

Childhood illnesses and treatment-seeking behaviour indicators

Indicator	Definition	Numerator	Denominator
Period Prevalence of Diarrhoea	Percentage of children 0–59 months who suffered from diarrhoea in the 2 weeks prior to the survey	Number of children reported 0–59 months who suffered from diarrhoea in the 2 weeks prior to the survey.	Total number of children 0–59 months
Care-Seeking for Diarrhoea	Percentage of children 0–59 months for whom advice or treatment was sought from a health facility or provider during the last episode of diarrhoea	Number of children 0–59 months for whom advice or treatment was sought from a health facility or provider during the last episode of diarrhoea	Total number of children 0–59 months
Proper Diarrhoea Treatment	Percentage of children 0–59 months who were treated during the last episode of diarrhoea by using: 1) ORS packets; 2) ORS packets with zinc supplements; 3) zinc supplements; and, 4) ORT (ORS + home fluid)	Number of children 0–59 months who were treated during the last episode of diarrhoea by using 1) ORS packets; 2) ORS packets with zinc supplements; 3) zinc supplements; and, 4) ORT (ORS + home fluid)	Total number of children 0–59 months
Period Prevalence of ARI	Percentage of children 0–59 months who suffered from cough with difficult breathing in the 2 weeks prior to the survey	Number of children 0–59 months who suffered from cough and/or difficult breathing in the 2 weeks prior to the survey	Total number of children 0–59 months
Period Prevalence of Fever	Percentage of children 0–59 months who suffered from fever in the 2 weeks prior to the survey	Number of children 0–59 months who suffered from fever in the 2 weeks prior to the survey	Total number of children 0–59 months
Antibiotic Treatment for ARI (Children with Cough and Difficult Breathing)	Percentage of children 0–59 months who received antibiotic treatment during the last episode of cough with difficult breathing	Number of children 0 – 59 months who received antibiotic treatment during the last episode of cough with difficult breathing	Total number of children 0–59 months
Care-Seeking for Children with Acute Respiratory Infection (ARI) Symptoms	Percentage of children 0–59 months for whom advice or treatment was sought from a health facility or provider during the last episode of cough with difficult breathing	Number of children 0–59 months for whom advice or treatment was sought from a health facility or provider during the last episode of cough with difficult breathing	Total number of children 0–59 months

Antenatal and postnatal care indicators

Indicator	Definition	Numerator	Denominator
At Least One ANC Visit	Percentage of PC reporting at least one antenatal care visit during their last pregnancy	Number of principal carers reporting at least one antenatal care visit during their last pregnancy	Total number of women aged 15–49 who have a child below 5 years of age
Gestational Age at First Visit	Percentage of principal carers who had their first visit in the 1st /2nd /3rd trimester during their last pregnancy	Number of principal carers who had their first visit in the 1st /2nd /3rd trimester	Total number of women aged 15–49 who have a child below 5 years of age
Four or More ANC Visits	Percentage of principal carers reporting four or more antenatal care visits during their last pregnancy	Number of principal carers reporting four or more antenatal care visits during their last pregnancy	Total number of women aged 15–49 who have a child below 5 years of age
IFA Supplementation During Pregnancy	Percentage of mothers reporting receiving iron and folic acid tablets (tablets shown) for at least three months	Number of principal carers reporting receiving iron and folic acid tablets for at least three months during their last pregnancy	Total number of women aged 15–49 who have a child below 5 years of age
Coverage of Postnatal Care	Percentage of principal carers who reported receiving a health check while in facility or at home following delivery, or a post-natal care visit within 2 days after the last delivery	Number of principal carers who reported receiving a health check while in facility or at home following delivery, or a post-natal care visit within 2 days after the last delivery	Total number of women aged 15–49 who have a child below 5 years of age
Night Blindness During Last Pregnancy	Percentage of principal carers reporting difficulty seeing in the evening or night or suffering from night blindness during last pregnancy	Number of principal carers reporting difficulty seeing in the evening or night or suffering from night blindness during last pregnancy	Total number of women aged 15–49 who have a child below 5 years of age
Care-Seeking for Children with Acute Respiratory Infection (ARI) Symptoms	Percentage of children 0–59 months for whom advice or treatment was sought from a health facility or provider during the last episode of cough with difficult breathing	Number of children 0–59 months for whom advice or treatment was sought from a health facility or provider during the last episode of cough with difficult breathing	Total number of children 0–59 months

Expanded programme for immunization coverage indicators

Indicator	Definition	Numerator	Denominator
BCG Coverage	Percentage of children below 12 months vaccinated for BCG by card, recall or scar	Number of children below 12 months who received vaccination for BCG by card, recall or scar	Total number of children below 12 months

Measles Vaccination Coverage - Single Dose	Percentage of children 9–12 months who received 1 dose of measles vaccination	Number of children 9 –12 reported that received 1 dose of measles vaccination	Total number of children 9–12 months
Full EPI Coverage for Children Below 12 Months	Percentage of children below 12 months who had received full appropriate vaccinations for their age (without rotavirus vaccine and measles 2)	Number of children below 12 months who had received full appropriate vaccinations for their age (without rotavirus vaccine and measles 2)	Total number of children 0–12 months

Insecticide-treated nets coverage indicator			
Indicator	**Definition**	**Numerator**	**Denominator**
Child Sleeps Under an ITN	Percentage of children 6–59 months who slept under an ITN on the night before the survey	Number of children reported use of ITN on the night before the survey	Total number of children 6–59 months

Access to health facility and health personnel indicators			
Indicator	**Definition**	**Numerator**	**Denominator**
Access to Health Services: Nearby	Percentage of HH reported to have access to nearby HF	Number of HH reported to have access to HF within 5 km (1-hour walk)	Total number of HHs
Access to Health Services: Within 5km	Percentage of HH reported to have access to HF within 5 km (1-hour walk)	Number of HH reported to have access to HF within 5 km (1-hour walk)	Total number of HHs
Access to CHW	Percentage of HH reported to have access to CHW within 5 km (1-hour walk)	Number of HH reported to have access to CHW within 5 km (1-hour walk)	Total number of HHs

Coping strategies index indicator			
Indicator	**Definition**	**Numerator**	**Denominator**
Coping Strategies	The Reduced Coping Strategy Index (rCSI) is used to assess the level of stress faced by a household due to a food shortage. It is measured by combining the frequency and severity of the food consumption-based strategies households are engaging in. It is calculated using the five standard strategies using a 7-day recall period.	NA	NA

Health and nutrition information indicators			
Indicator	**Definition**	**Numerator**	**Denominator**
Knowledge of Principal Carers about Malnutrition Treatment Services	Percentage of principal carers with knowledge about malnutrition treatment services	Number of principal carers with knowledge about malnutrition treatment services	Total number of principal carers
Knowledge of Principal Carer about Growth Monitoring Promotion (GMP)	Percentage of principal carers with knowledge about growth monitoring promotion (GMP)	Number of principal carers with knowledge about growth monitoring promotion (GMP)	Total number of principal carers
Preferable Source of Information/ Channels of Health Promotion Messages	Percentage of principal carers reporting their preferred sources of information / health promotion (interpersonal, radio, TV, WhatsApp, Facebook, etc.)	Number of principal carers reporting each preferences of different information channels.	Total number of principal caregivers
Preferred Programme	Percentage of principal carers reporting radio and TV as preferred sources, what is their preferred programme	Number of principal carers reporting radio and TV as preferred sources	Total number of principal caregivers
Preferred Time	Percentage of principal carers reporting radio and TV as preferred sources, who prefer listening / watching at morning / noon / evening / night	Number of principal carers reporting radio and TV as preferred sources, who prefer listening / watching at morning / noon / evening / night	Number of principal carers reporting radio and TV as preferred sources

Water, sanitation and hygiene indicators			
Indicator	**Definition**	**Numerator**	**Denominator**
Basic Drinking Water Sources	Percentage of households reporting use of basic drinking water sources, which are those that have the potential to deliver safe water by nature of their design and construction, with collection time of not more than 30 minutes for a roundtrip including queuing. They include: 1) piped water; 2) boreholes or tube-wells; 3) protected dug wells/springs; 4) rainwater harvesting; 5) packaged (bottled water); and, 6) delivered (trucked from one of the above).	Number of households reporting use of basic drinking water sources	Total number of households

Basic Sanitation Facilities	Percentage of households reporting use of basic sanitation facilities, which are designed to hygienically separate excreta from human contact and are not shared with other households. They include: 1) flush/pour flush to piped sewer system, septic tanks or pit latrines; 2) ventilated improved pit latrines; 3) composting toilets; and, 4) pit latrines with slabs.	Number of households reporting use of basic sanitation facilities	Total number of households
Practice of Open Defecation	Percentage of households which are not using any type of latrines and practicing open defecation which is identified as disposal of human feces in fields, forests, bushes, open bodies of water, beaches and other open spaces or with solid waste.	Number of households which are practicing open defecation	Total number of households
Handwashing Practices	Percentage of principal carers with knowledge of the five hand-washing critical times which are: 1) after defecation; 2) after cleaning child who has defecated; 3) before eating; 4) before feeding child; and, 5) before preparing food and cooking.	Number of principal carers with knowledge of each of five handwashing critical times	Total number of principal carers
Availability of Handwashing Facilities	Percentage of households with fixed or moving handwashing facility with soap and water available. Presence of ash instead of soap will indicate limited (not basic) handwashing facilities.	Number of households with fixed or moving handwashing facility with soap and water available	Total number of households

Education indicators

Indicator	Definition	Numerator	Denominator
Access to Preschool (Net Enrolment)	Net enrolment rate is the total enrolment in preschool in a given year, expressed as a percentage of the official school-age population for preschool (4 – 5 years) (disaggregated by gender).	Number of children (4 – 5 years) enrolled in pre-school (M/F)	Official pre-school-age population (4 – 5 years) (M/F)
Access to Basic Education (Net Enrolment)	The net primary enrolment rate is the ratio of official school-age children enrolled in primary school to the total population of children of official primary school age, as defined by the national education system (disaggregated by gender).	Number of pupils of official age (6 – 13 years). Exclude underage and above pupils (M/F)	Official primary school-age population (6 – 13 years) (M/F)
Access to Education (Net Enrolment)	Is the ratio of pre-school and official school-age children enrolled in pre-school and primary school respectively to the total population of children of official pre-school/primary school age, as defined by the national education system (disaggregated by gender).	Number of pupils (4 – 13) years who attended pre-school or school based on their age (M/F)	Official preschool and primary school-age population (4 – 13 years) (M/F)
Reason for Being out of School	Percentage of reasons for being out of school reported by PC.	Numbers of pupils out-of-school reporting each reason	Total number of children out of school

Child protection indicators

Indicator	Definition	Numerator	Denominator
Birth Registration	Percentage of children 0-59 months.	Number of children 0 – 59 months whose births are reported registered and/or have BC	Total number of children 0 – 59 months
Child Marriage	Percentage of women aged 15-49 years who were married before age 15.	Number of women age 15 – 49 years who were first married before age 15	Total number of women age 15 – 49 years
Child Marriage	Percentage of women aged 15-49 years who are married.	Number of women age 15 – 19 years who are married	Total number of women age 15 – 19 years
Female Genital Mutilation/ Cutting 1	Percentage of women aged 15-49 years who have undergone FGM.	Number of women age 15 – 49 years who report to have undergone any form of FGM/C	Total number of women age 15 – 49 years
Female Genital Mutilation/ Cutting 2	Percentages of girls aged 0-14 years who have undergone FGM.	Number of daughters age 0 – 14 years who have undergone any form of FGM/C, as reported by mothers age 15 – 49 years	Total number of daughters age 0 – 14 years of mothers age 15 – 49 years
Female Genital Mutilation/ Cutting 3	Percentages of girls aged 0-8 years who have undergone FGM.	Number of daughters age 0 – 8 years who have undergone any form of FGM/C, as reported by mothers age 15 – 49 years	Total number of daughters age 0 – 8 years of mothers age 15 – 49 years

Child health insurance coverage indicator

Indicator	Definition	Numerator	Denominator
Health Insurance Coverage	Percentage of population covered by health insurance.	Number of people covered by health insurance	Total population in sampled HHs

2.3 Survey implementation

The survey started in July 2018 in Al-Gazeera and was then rolled out state-by-state, finishing in Al-Gadarif by the end of January 2019. The following steps were undertaken during implementation.

2.3.1 Planning and preparations

Planning of the S3M II survey, and in particular the time frame of activities, was based on the previous experience of undertaking S3M I. But it also was influenced by the inputs of stakeholders at the federal and state levels, particularly members of the S3M II technical committee at the federal level. This committee included members from the WHO, the WFP, the Ministry of Education (MOE), the Ministry of Security and Social Welfare (MOSSW), the Ministry of Agriculture (Food Security Directorate), the Ministry of Health (FMOH), and UNICEF.

The FMOH and UNICEF, through the S3M II technical committee, regularly engaged with key stakeholders, one to two times per week during the planning phase and ensured their involvement in the analysis stage. All technical committee members were invited to participate in the data analysis workshops. Other stakeholders, like the Central Bureau of Statistics (CBS), were consulted and informed of the progress achieved during each of the key stages (preparation, data collection and data analysis), while stakeholders such as donors were informed of progress. In addition, in every state, state-level technical committees were formed and operated to support the planning, data collection and analysis processes. Key achievements were based on the close engagement with the FMOH and stakeholders and include the following:

- Consensus on the survey timeline.
- Establishment of federal- and state-level technical working groups with clear Terms of Reference (ToRs).
- Nomination of FMOH survey lead.
- Agreement on the human resources required to undertake the survey at the various levels (supervisors, enumerators, ICT support for digital data collection, external expertise needs, etc.), including the composition of the overall team as well as the state-specific teams for data collection, data analysis and more.
- Regular and close communication (minimum daily during the process of data collection) with state technical teams, in particular those of the state FMOH.
- Agreement on the budget of each of the activities, as well as the contribution from all stakeholders/donors.

2.3.2 Obtaining ethical approvals

The ethical approval request was prepared by the FMOH and submitted to the ethics committee at the research department at the FMOH. Ethical approval was granted from FMOH for both S3M II and the nested micronutrients survey. All other relevant approvals related to undertaking the survey were obtained, including visas for international consultants supporting the survey, travel permits etc.

2.3.3 Obtaining detailed maps of every state

Detailed maps for all states were obtained through a successful partnership between UNICEF, FMOH and CBS. A joint workshop was hosted at the CBS in May 2018, followed by field visits in June 2018 to verify all coordinates. This was followed by joint field visits to obtain and physically collect any missing coordinates.

2.3.4 Engaging technical expertise

UNICEF, Valid International and Brixton Health were contracted, and the organizations worked closely with FMOH and UNICEF throughout the survey as planned. It should be noted that the individuals included in the institutional contract were the experts who developed and later refined the S3M methodology, and they had also provided support to the wider Sudan team with the undertaking of the S3M I survey in 2013.

2.3.5 Identifying staff

Survey leads included 9 UNICEF, 20 FMOH, 18 State Ministry of Health (SMOH), and 4 WHO staff members who were identified to supervise data collection and management. Earlier, during the Gezira pilot, these supervisors were trained and served as data collectors to sharpen their skills to lead the data collection process in their respective states.

After the Gezira pilot, the remaining 17 states were divided into two rounds for the undertaking of the actual survey. Enumerators and state-level team leaders were identified for each state by UNICEF and FMOH based on the state-level training.

Finally, a third-party ICT company (IntelliSoft) was contracted by the FMOH to develop data collection digital tools and to provide ICT technical support and troubleshooting for tablets and software issues. This entailed the presence of one ICT person in each state throughout the data collection.

2.3.6 Carrying out sampling

Sampling was carried out from 11 to 23 July 2018 by UNICEF and Ministry of Health staff in accordance with the S3M sampling methodology. Across the country, settlements were mapped into villages and city blocks. The field visits occurred just prior to this (as mentioned in 2.3.3 above), which resulted in the assignment of correct GPS coordinates for more than 25,000 villages across the country.

Based on the mapping of settlements, the distribution of primary sampling units was selected for each locality. This was done based on random sample selection using sampling software designed to undertake S3M variable density sampling. The approach and selection were approved for their rigor and appropriateness by external technical experts from Valid International.

From the selected villages, consultations with state authorities, including State Ministries of Health (SMOH), Humanitarian Aid Commission (HAC), and the National Intelligence and Security Service (NISS), were held to ensure the accessibility and security of villages for the survey teams. In the case of inaccessible villages, a replacement was made using the same sampling software. Further selection of households was done during the actual survey data collection, under the oversight of the external technical experts.

2.3.7 Training

Master training was carried-out in Gezira state (the pilot location) in July-August 2018 to test tools, including digital data collection tools and laboratory testing for micronutrient indicators. Other goals of this master training were to test logistics and to train survey supervisors (through a training of trainers). Upon the identification of staff, all supervisors received training from 16 to 25 July. This group included: 9 UNICEF supervisors; 4 WHO supervisors;18 SMOH supervisors; and the 20 FMOH supervisors (including 9 from Gezira state). The group trained on the following topics:

- S3M II methodology
- S3M II questionnaire
- Digital data collection tools (tablets)
- Micronutrient samples collection and storage
- TORs of all personnel and groups
- Anthropometric measurements standardization
- S3M II monitoring tools
- S3M II logistic, data collection plans and quality assurance
- Local calendar
- S3M II sampling including urban sampling

In addition, 18 state nutrition directors received basic training on the S3M II methodology and indicators, plus the roles and responsibilities of the committees involved. Further training for the supervisors of the micronutrient survey were done separately. This was followed by data collection in Gezira state, which was carried out by supervisors. Subsequent state-level trainings were later conducted prior to data collection in each state.

2.3.8 Data collection

Data from phase one states (North Darfur, East Darfur, West Kordofan, River Nile, Sennar, South Darfur, North Kordofan, Khartoum and Northern states) was collected in October 2018. Data from phase two states (White Nile, Kassala, Blue Nile, Central Darfur and West Darfur, Red Sea, South Kordofan and Gedaref states) was collected from November 2019 to January 2019.

Close monitoring, supportive supervision, and capacity-building to the Ministry of Health staff continued throughout the first phase. Technical assistance was provided from UNICEF S3M II technical staff and Valid International throughout all phases of data collection.

Definition of carer

The data was often collected from the principal carer of children under 5 years of age in the household. The principal carer (often globally referred to as 'caregiver') is the primary household caregiver. This is normally the head of the household-usually a child's mother or other primary caregiver – but the carer can also be male (i.e., if the mother has died and the father is looking after the child alone).

2.3.9 Data entry

For the S3M II survey it was decided to use tablets for digital data collection in real time to minimize data entry mistakes by having to translate written forms into digital form. To ensure the quality of data, all data entries were checked on a daily basis.

2.4 Data analysis

Data analysis was performed using the R language for statistical computing[37] . Data analysis procedures accounted for the sample design. This survey is a two-stage sample. Subjects are sampled from a small number of primary sampling units (PSUs). This survey is not prior weighted. This means that per-PSU sampling weights will be needed. These are usually the populations of the PSU.

2.4.1 Analytical approach for locality-level results

For this survey, the blocked weighted bootstrap estimation approach was used:

- **Blocked:** The block corresponds to the PSU or cluster.
- **Weighted**: The sampling procedure for this survey does not use population proportional sampling to weight the sample prior to data collection, as is done with SMART-type surveys. This means that a posterior weighting procedure is required. The 'roulette wheel' algorithm to weight (i.e., by population) the selection probability of PSUs in bootstrap replicates will be utilized.

A total of *m* PSUs are sampled with-replacement from the survey dataset where *m* is the number of PSUs in the survey sample. Individual records within each PSU are then sampled with-replacement. A total of *n* records is sampled with-replacement from each of the selected PSUs, where *n* is the number of individual records in a selected PSU. The resulting collection of records replicates the original survey in terms of both sample design and sample size. A large number of replicate surveys are taken (minimum of (r = 399) replicate surveys, but this can be changed). The required statistic (e.g., the mean of an indicator value) is applied to each replicate survey. The reported estimate consists of the 50th (point estimate), 2.5th (lower 95 per cent confidence limit), and the 97.5th (upper 95 per cent confidence limit) percentiles of the distribution of the statistic observed across all replicate surveys. The blocked weighted bootstrap procedure is outlined *(see Figure 4)*.

[37] Team, R., R Core Team (2018). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Available online at https://www.R-project.org/.

The principal advantages of using a bootstrap estimator are:

- Bootstrap estimators work well with small sample sizes.
- The method is non-parametric and uses empirical rather than theoretical distributions. There are no assumptions of things like normality to worry about.
- The method allows estimation of the sampling distribution of almost any statistic using only simple computational methods.

2.4.2 Analytical approach for state-level and national-level results

Along with a locality-level point estimate and upper and lower 95 per cent confidence limits, the standard deviation (SD) of the set of bootstrap replicator estimator replicates was calculated. A robust estimator of the SD was used for this purpose:

$$SE = Robust\ SD = \frac{Interquartile\ range}{1.34898}$$

Wider area point estimates for state- and national-level results were made by combining the locality point estimates using a weighted average procedure for each indicator:

$$\theta_{pooled} = \frac{\sum_{i=1}^{k} \theta_i \times w_i}{\sum_{i=1}^{k} w_i}$$

where θ_i is the estimated indicator value in locality *i*, and w_i is the population of locality *i* for all *k* localities in the areas of interest. Locality populations were provided by the Sudan Central Bureau of Statistics.

Standard errors for each of the wide area estimate were calculated by pooling the standard errors of locality estimates in the area of interest using a similar weighted average procedure:

$$SE_{pooled} = \sqrt{\frac{\sum_{i=1}^{k} SE_i^2 \times w_i}{\sum_{i=1}^{k} w_i}}$$

Approximate 95 per cent confidence limits on wide-area estimates were calculated using the normal approximation:

$$\theta_{pooled} \pm 1.96 \times SE_{pooled}$$

When applied to extreme indicator values (i.e., point estimates close to 0 per cent or 100 per cent) this procedure occasionally gave rise to 95 per cent confidence limits falling slightly below 0 per cent and 95 per cent confidence limits falling slightly above 100 per cent. In these cases, the limits were adjusted so that they were very close to, but not meeting, the theoretical limits (i.e., < 0 per cent to 0.01 per cent and > 100 per cent to 99.99 per cent).

It should be noted that this procedure for estimating state-level and national-level estimates was applied to all indicators except for the household water indicators. For these indicators, the calculation of a robust SD via bootstrap was not possible, as only locality-level boostrap point estimates and 95 per cent confidence limits data were made available. Instead, the standard error was calculated as:

$$SE = \frac{Upper\ confidence\ limit - Lower\ confidence\ limit}{2 \times 1.96}$$

and then used as above to calculate the state- and national-level point estimates using the weighted pooled SE procedure.

2.4.3 Analytical approach for mapping indicators

The indicator mapping creates a surface map of indicator values using spatial interpolation. There are various approaches and methods of spatial interpolation, with the main differences determined by the weights applied to the point dataset to estimate values at each of the unknown points of the surface map. For the *Sudan S3M*, spatial interpolation was performed using the inverse distance weighting (IDW) method. As the name implies, the IDW method uses weights that are inversely proportional to the distance of a point being estimated from the sampling point locations (E. Isaaks and Srivastava 1989; Diggle and Ribeiro 2007; Diggle 2013). This can be mathematically demonstrated as follows:

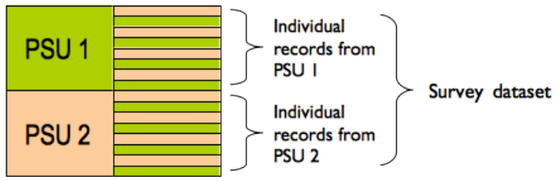
$$\hat{v} = \frac{\sum_{i=1}^{n} \frac{1}{d_i^p} v_i}{\sum_{i=1}^{n} \frac{1}{d_i^p}}$$

where $d_1 \dots d_n$ are distances from each n sampling points to estimation point, p power of the distance and $v_1 \dots v_n$ are sample values.

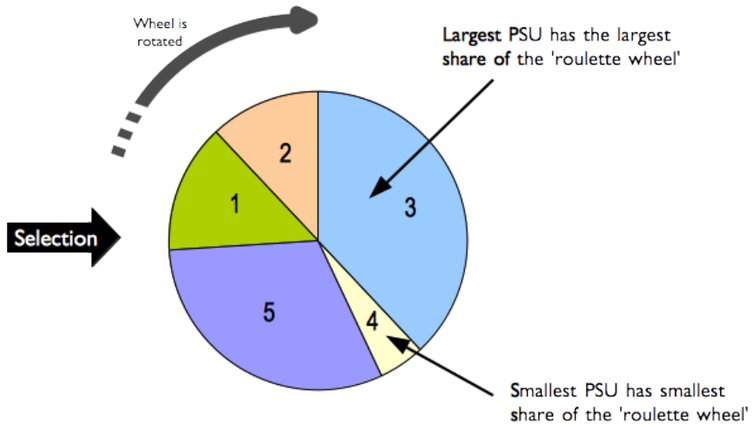
The power of the distance *p* is an important aspect of the IDW method for point estimation. The influence of *p* to the weights applied to the point estimation is such that as *p* approaches 0, the weights become more similar, thereby giving more weight to the nearest sample values. As *p* approaches infinity, the weights become more different from each other, thereby giving more weight to the closest sample. The power of the distance *p* has been traditionally set at 2 as standard.

FIGURE 4: The blocked weighted bootstrap

Data are collected using a two-stage cluster design:

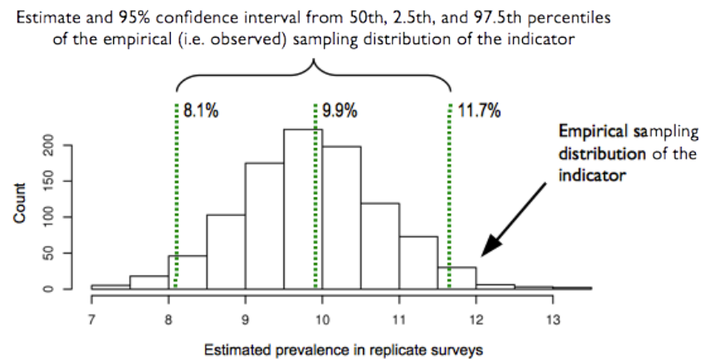


PSUs are selected from the survey dataset *with-replacement* and with probability proportional to population size (PPS) using a *roulette wheel* algorithm :



PSUs are selected *with-replacement* and proportional to population size (PPS) :

Individual records are selected *with-replacement* from within each PSU to create a *replicate* survey. The estimator is applied to the replicate survey and the result recorded. This process is repeated many times. The estimate of the indicator value is made from the distribution of the results from each replicate survey which is the *empirical sampling distribution* of the indicator :



CHAPTER 3

RESULTS AND DISCUSSIONS

3. RESULTS AND DISCUSSIONS

3.1 Child nutritional status

The nutritional status of children aged 6-59 months was assessed via anthropometric measurements of weight, height and mid-upper-arm circumference (MUAC) using standard measurement tools for such purpose. Using weight and height measurements, corresponding nutritional indices of weight-for-age Z-score (WAZ), height-for-age Z-score (HAZ), and weight-for-height Z-score (WHZ) were calculated using the WHO Child Growth Standards (WGS) as reference standard (WHO 2006) to determine the child's underweight status, stunting status and wasting status, respectively. The Z-scores were calculated using the Z-scorer package in R software. MUAC, on the other hand, was used as-is without standardization and assessed based on accepted cut-offs for wasting status (WHO/UNICEF 2009). Finally, nutritional oedema was assessed clinically using the bilateral pitting oedema test.

Following are the prevalence of various forms of undernutrition in children 6-59 months.

3.1.1 Stunting

The **mean HAZ** of children 6-59 months old in Sudan was-1.49 (95 per cent CI:-1.71–1.28) Z-score.

Stunting average results

Among the states, the mean HAZ was highest in Khartoum state at-1.07 (95 per cent CI:-1.3–0.85) Z-score while Red Sea state had the lowest mean HAZ at-1.90 (95 per cent CI:-2.18–1.62) *(see Figure 5)*.

Among the localities, Khartoum locality in Khartoum state had the highest mean HAZ at-0.56 (95 per cent CI:-0.79 –-0.34). Khartoum locality has significantly higher mean HAZ than all other localities of Sudan. Of all the localities, four have a significantly lower mean HAZ: Refi Hamashkureib and Rural Telkok in Kassala state; El Ganab Elawlaib in Red Sea state; and Sharg El Jabal in South Darfur *(see Figure 5)*.

Global stunting/stuntedness prevalence was at 36.35 per cent (95 per cent CI: 29.56-43.14 per cent). **Moderate stunting/stuntedness prevalence** was at 21.25 per cent (95 per cent CI: 12.81-29.7 per cent). **Severe stunting/stuntedness prevalence** was at 15.06 per cent (95 per cent CI: 9.87-20.25 per cent).

Among the states, Red Sea state had the highest prevalence of global and severe stunting/stuntedness, while North Darfur had the highest prevalence of moderate stunting/stuntedness. South Darfur state had the lowest prevalence of global and severe stunting/stuntedness and Khartoum had the lowest prevalence of moderate stunting/stuntedness *(see Figure 6)*.

There is great inter-locality variability within Kassala state and South Darfur state, where outlier localities face extremely high prevalences of stunting. In Khartoum state, outlier localities have low prevalences of stunting *(see Figure 7)*. Of all the localities, 49.5 per cent had global stunting/stuntedness prevalences greater than 40 per cent.

Table 1 and Table 2 present results per locality, per state and national for mean HAZ and prevalence of global, moderate and severe stunting/stuntedness.

FIGURE 5: Box plot of state and locality results for mean height-for-age Z-score (HAZ)

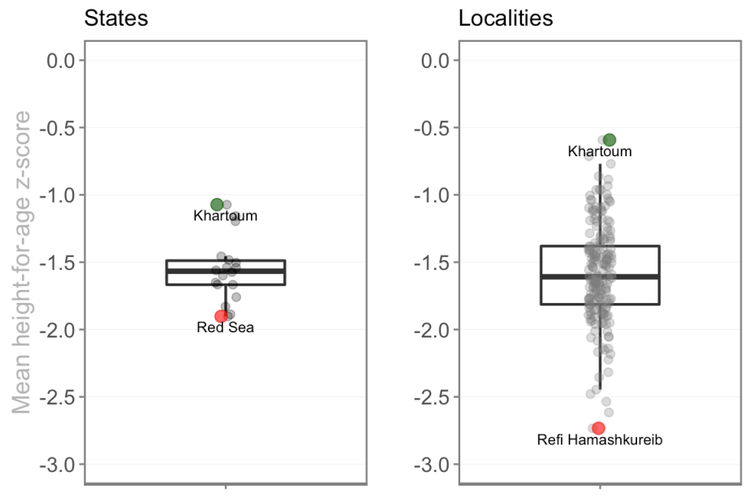


FIGURE 6: Box plot of state results of child stunting by HAZ

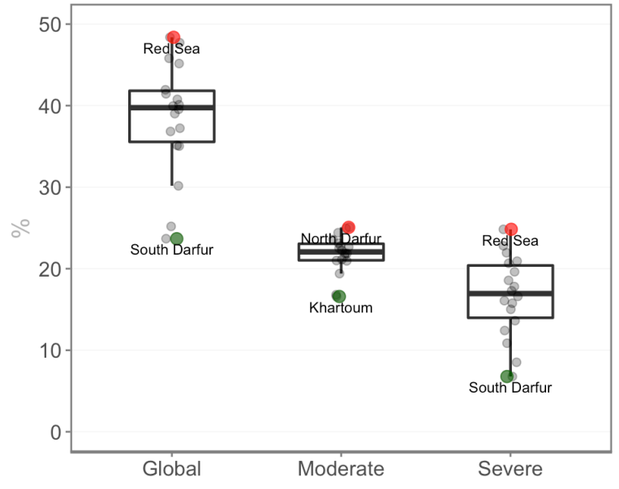
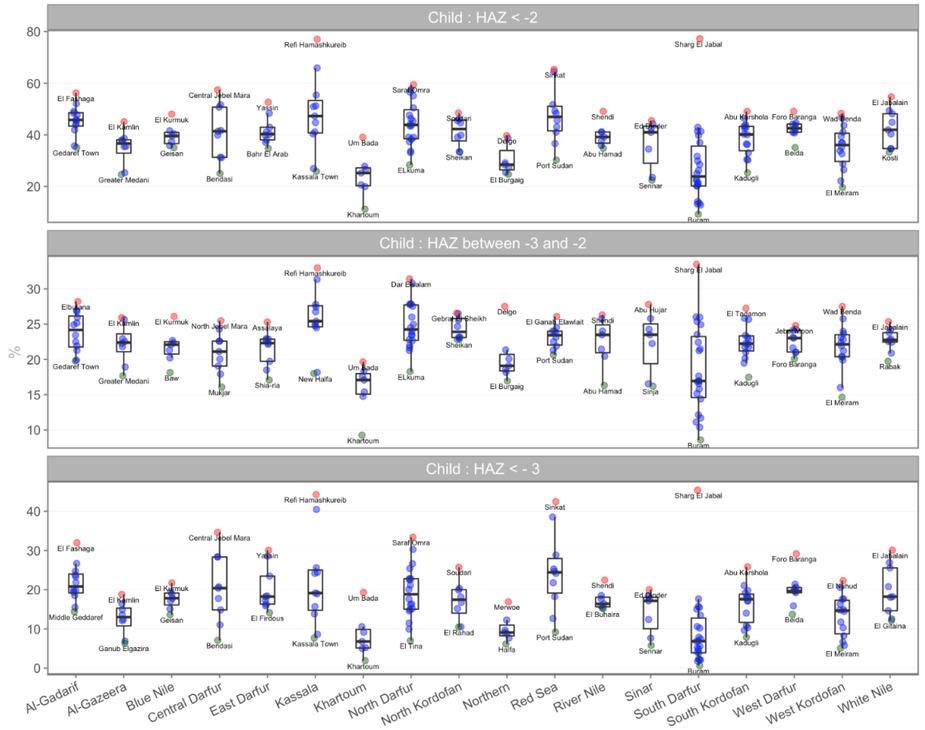


FIGURE 7: Box plot of locality results of child stunting by HAZ



All states in Sudan had a stunting rate above the high threshold of 20-30 per cent. The five states with the lowest global stunting prevalence were: Khartoum (25.2 per cent); South Darfur (23.7 per cent); and Northern (30.2 per cent) states. The rest of the states had stunting prevalences above the WHO very-high-stunting threshold of 30 per cent. The five states with the highest global stunting prevalence were: North Darfur (45.8 per cent); Red Sea (48.4 per cent); Al-Gadarif (45.2 per cent); Kassala (47.7 per cent); and Central Darfur (42 per cent).

Stunting comparison between S3M I and S3M II

Comparing S3M I with S3M II results showed that the stunting prevalence increased significantly in four places: North Darfur (from 35.2 per cent in 2013 to 45.8 per cent); West Darfur (from 34.8 per cent in 2013 to 41.5 per cent); River Nile (from 28.4 per cent in 2013 to 39 per cent); and in Khartoum state (from 20.2 per cent in 2013 to 25.2 per cent). In contrast, the stunting prevalence significantly decreased in three states: Kassala (from 54.6 per cent in 2013 to 47.8 per cent); Al-Gadarif (from 52 per cent in 2013 to 45.2 per cent); and Blue Nile (from 49.8 per cent in 2013 to 37.2 per cent).

The S3M II reflected that 162 of the total 185 localities (88 per cent) had a stunting rate above 20 per cent. In addition, 128 localities (69 per cent) had a stunting rate above 30 per cent, and 86 localities (46 per cent) had a global stunting prevalence greater than 40 per cent.

The high prevalence of stunting in both S3M I and S3M II results reflected the lack of integrated, long-term programming that addresses the multi-sectoral, underlying causes of malnutrition and contributes to a reduction in stunting and its long-term negative impacts.

TABLE 1: Mean HAZ and stunting prevalence by state and national

State	Mean HAZ %			HAZ < -2 %			HAZ between -3 and -2 %			HAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	-1.76	-1.98	-1.54	45.16	39.03	51.28	23.14	14.73	31.54	21.95	16.37	27.54
Al-Gazeera	-1.46	-1.65	-1.26	35.04	29.56	40.52	22.51	15.53	29.49	12.42	7.66	17.19
Blue Nile	-1.50	-1.72	-1.29	37.23	31.26	43.20	21.13	13.46	28.79	16.08	10.90	21.27
Central Darfur	-1.65	-1.94	-1.36	41.95	32.56	51.34	20.96	9.20	32.71	20.93	12.62	29.24
East Darfur	-1.54	-1.79	-1.28	39.55	33.92	45.19	21.00	13.03	28.98	18.57	13.06	24.07
Kassala	-1.89	-2.06	-1.71	47.72	41.41	54.03	24.95	16.48	33.42	22.81	17.62	28.01
Khartoum	-1.07	-1.30	-0.85	25.19	18.03	32.34	16.59	8.35	24.82	8.52	4.42	12.61
North Darfur	-1.83	-2.07	-1.59	45.80	37.41	54.19	25.07	14.21	35.94	20.66	14.14	27.18
North Kordofan	-1.67	-1.83	-1.50	40.11	35.28	44.94	24.41	17.78	31.03	15.77	11.43	20.12
Northern	-1.20	-1.43	-0.96	30.17	22.77	37.56	19.40	10.89	27.92	10.86	5.56	16.15
Red Sea	-1.90	-2.18	-1.62	48.38	40.11	56.65	23.58	12.04	35.11	24.83	17.04	32.61
River Nile	-1.56	-1.76	-1.36	39.02	31.64	46.39	22.25	14.06	30.44	16.61	11.05	22.17
Sennar	-1.48	-1.69	-1.28	35.13	29.26	41.00	21.57	13.88	29.26	13.63	9.01	18.26
South Darfur	-1.16	-1.35	-0.96	23.68	16.17	31.19	16.81	8.19	25.42	6.78	2.56	10.99
South Kordofan	-1.67	-1.90	-1.44	40.77	31.75	49.79	22.80	12.21	33.39	17.81	11.28	24.35
West Darfur	-1.57	-1.78	-1.36	41.45	35.95	46.95	21.86	14.31	29.41	19.62	14.79	24.45
West Kordofan	-1.54	-1.73	-1.36	36.83	31.20	42.46	21.88	15.11	28.65	15.02	10.89	19.16
White Nile	-1.60	-1.81	-1.39	39.95	33.50	46.40	22.68	15.30	30.06	17.29	12.51	22.08
Sudan	-1.49	-1.71	-1.28	36.35	29.56	43.14	21.25	12.81	29.70	15.06	9.87	20.25

TABLE 2: Mean HAZ and stunting prevalence by locality and by state

Location	Mean HAZ %			HAZ < -2 %			HAZ between -3 and -2 %			HAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	-1.04	-1.25	-0.78	26.85	20.21	34.50	17.40	9.51	26.26	9.44	5.62	13.62
El Golid	-1.17	-1.34	-1.01	28.75	21.95	35.04	19.99	11.18	27.79	8.72	4.83	14.03
Merwoe	-1.47	-1.70	-1.25	38.63	29.74	43.73	21.94	11.76	30.37	21.94	10.77	22.02
El Daba	-1.05	-1.29	-0.72	27.11	19.61	33.79	17.90	9.10	26.27	9.19	4.96	14.74
Halfa	-1.15	-1.33	-0.98	26.96	23.01	30.70	18.81	13.76	23.68	7.89	5.10	11.38
Delgo	-1.51	-1.69	-1.28	37.76	30.78	43.12	24.94	17.04	31.51	12.70	8.57	17.05
El Burgaig	-1.16	-1.42	-0.93	25.12	18.98	32.50	17.12	10.20	26.05	7.74	4.06	12.53
Northern State	-1.20	-1.43	-0.96	30.17	22.77	37.56	19.40	10.89	27.92	10.86	5.56	16.15
El Matama	-1.66	-1.87	-1.46	39.48	32.34	47.42	23.56	14.16	32.59	15.92	10.06	22.16
Shendi	-1.90	-2.07	-1.70	49.39	41.69	57.99	26.55	17.62	35.22	22.37	17.29	29.99

TABLE 2: Mean HAZ and stunting prevalence by locality and by state

Location	Mean HAZ %			HAZ < -2 %			HAZ between -3 and -2 %			HAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Hamad	-1.36	-1.67	-1.11	33.44	27.41	47.97	16.86	6.40	32.25	17.04	10.80	23.93
Barbar	-1.43	-1.71	-1.20	35.82	30.02	46.49	20.32	11.02	31.21	15.26	10.08	22.30
El Damar	-1.50	-1.65	-1.34	36.80	32.46	39.73	21.73	16.21	26.44	15.00	11.52	18.14
Atbara	-1.29	-1.47	-1.13	31.14	24.46	37.62	21.29	12.79	29.02	9.66	5.96	15.43
El Buhaira	-1.53	-1.78	-1.27	41.60	36.25	47.69	25.89	19.05	32.79	15.54	11.97	19.16
River Nile State	-1.56	-1.76	-1.36	39.02	31.64	46.39	22.25	14.06	30.44	16.61	11.05	22.17
Khartoum	-0.56	-0.79	-0.34	9.74	6.14	15.69	8.01	3.75	14.03	1.52	0.60	4.01
Bahri	-0.89	-1.12	-0.71	20.16	15.26	28.61	14.94	8.13	22.94	5.35	3.36	10.66
Um Durman	-1.23	-1.48	-1.04	27.92	22.01	34.67	17.44	9.41	25.30	10.34	6.91	16.68
Um Bada	-1.32	-1.54	-1.13	36.85	27.16	41.97	20.60	9.66	29.45	16.07	9.19	21.41
Jebel Awlia	-1.04	-1.30	-0.71	26.36	20.41	33.10	17.52	10.64	24.83	8.95	5.10	12.05
Sharg Elneel	-1.20	-1.43	-0.95	26.17	20.70	36.69	18.48	10.66	29.11	7.37	4.42	13.83
Karrari	-1.10	-1.32	-0.88	22.53	15.75	32.01	16.13	7.07	26.75	5.90	2.89	11.84
Khartoum State	-1.07	-1.30	-0.85	25.19	18.03	32.34	16.59	8.35	24.82	8.52	4.42	12.61
Greater Medani	-1.18	-1.38	-1.00	24.16	17.30	30.59	17.80	9.03	25.66	6.60	3.77	10.40
Ganub Elgazira	-1.19	-1.38	-1.02	25.43	21.03	32.55	18.84	13.41	26.32	6.59	3.94	11.18
El Hassahisa	-1.56	-1.73	-1.37	39.58	33.99	46.02	25.24	18.43	33.00	14.16	9.65	19.13
El Kamlin	-1.84	-2.08	-1.67	45.09	40.07	49.39	25.76	18.09	32.49	18.77	13.71	24.56
Sharg El Gezira	-1.45	-1.68	-1.19	35.42	27.09	40.62	22.83	13.93	28.84	12.31	8.73	16.58
Um Elqura	-1.70	-1.87	-1.52	41.97	32.06	49.73	23.91	12.69	34.16	17.47	10.00	23.78
El Manaqil	-1.50	-1.70	-1.33	36.73	32.93	41.91	23.29	17.57	29.63	13.56	9.99	18.31
El Qurashi	-1.34	-1.50	-1.16	35.09	29.98	39.39	21.85	15.76	28.19	13.11	7.87	17.94
Al-Gazeera State	-1.46	-1.65	-1.26	35.04	29.56	40.52	22.51	15.53	29.49	12.42	7.66	17.19
Sennar	-1.04	-1.24	-0.86	23.28	18.31	29.04	16.98	11.13	23.48	6.43	3.81	9.83
Sharg Sennar	-1.72	-1.89	-1.54	40.64	34.95	47.56	23.74	15.48	32.03	17.22	12.56	23.52
Sinja	-1.04	-1.25	-0.82	23.84	17.86	28.45	16.33	8.94	22.54	7.46	4.03	10.79
Abu Hujar	-1.82	-2.07	-1.58	43.88	38.23	49.68	26.04	18.86	35.19	17.86	11.31	23.20
El Dali	-1.79	-2.01	-1.59	43.97	38.16	51.31	24.01	15.89	32.71	20.05	14.95	24.90
Es Suki	-1.44	-1.61	-1.24	33.33	26.79	39.21	21.78	13.15	29.33	12.01	7.31	16.20
Ed Dinder	-1.96	-2.11	-1.75	47.93	41.85	53.43	25.56	17.99	33.36	22.12	17.14	27.67
Sennar State	-1.48	-1.69	-1.28	35.13	29.26	41	21.57	13.88	29.26	13.63	9.01	18.26
Ed Damazine	-1.28	-1.47	-1.07	31.17	24.87	37.38	19.90	13.22	27.26	11.41	7.35	15.86
El Tadamon	-1.74	-1.90	-1.58	40.43	37.22	47.26	22.65	17.46	29.39	17.75	14.78	21.99
El Roseiris	-1.49	-1.66	-1.31	36.03	31.69	41.20	20.71	14.84	27.35	15.31	11.60	19.58
Baw	-1.35	-1.69	-1.02	38.04	30.48	45.71	18.46	8.33	28.71	19.02	13.03	27.53
Geisan	-1.55	-1.71	-1.37	35.19	29.45	40.20	21.09	14.03	27.70	13.80	9.79	18.76
El Kurmuk	-1.94	-2.20	-1.65	48.02	38.46	52.72	25.89	15.82	35.78	22.01	14.02	26.11
Wad El Mahi	-1.52	-1.71	-1.31	39.18	34.03	44.11	21.38	14.37	27.84	17.98	13.57	21.51

TABLE 2: Mean HAZ and stunting prevalence by locality and by state

Location	Mean HAZ %			HAZ < -2 %			HAZ between -3 and -2 %			HAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Blue Nile State	-1.5	-1.72	-1.29	37.23	31.26	43.2	21.13	13.46	28.79	16.08	10.9	21.27
Kosti	-1.41	-1.65	-1.22	32.81	28.79	39.31	20.43	15.38	27.94	12.17	9.26	16.21
Guli	-1.89	-2.05	-1.70	50.52	45.55	56.13	23.48	17.23	30.35	26.94	22.83	31.00
Tendalti	-1.72	-1.95	-1.52	45.78	40.59	50.25	23.26	16.70	29.03	22.55	17.81	27.38
Es Salam	-1.70	-1.88	-1.54	40.52	35.80	48.38	22.51	13.84	31.14	18.37	13.59	24.12
Rabak	-1.34	-1.53	-1.14	32.90	27.28	38.44	19.86	12.39	26.83	12.93	8.98	18.28
El Jabalain	-1.92	-2.19	-1.73	47.70	39.91	54.52	24.43	13.55	33.58	23.51	16.92	30.17
El Diwaim	-1.72	-1.98	-1.43	45.04	40.31	50.99	24.33	17.04	32.94	20.90	16.49	26.49
Um Rimta	-1.67	-1.89	-1.47	41.82	31.93	48.15	23.71	14.69	33.42	18.00	10.80	23.77
El Gitaina	-1.49	-1.64	-1.35	35.63	28.90	41.53	23.97	15.34	30.85	11.75	7.58	16.71
White Nile State	-1.6	-1.81	-1.39	39.95	33.5	46.4	22.68	15.3	30.06	17.29	12.51	22.08
Port Sudan	-1.47	-1.73	-1.23	36.00	28.34	46.26	23.62	14.78	34.26	12.40	8.04	18.70
Swakin	-1.87	-2.07	-1.72	44.33	37.54	49.73	24.74	15.46	33.43	19.87	13.04	26.19
El Gonob Welawlaib	-2.61	-2.81	-2.37	68.71	63.08	75.53	26.61	17.08	34.98	41.95	37.09	49.66
Sinkat	-2.44	-2.63	-2.27	65.16	53.05	69.31	22.33	11.36	33.95	43.10	31.30	46.74
Haya	-1.79	-2.13	-1.45	45.49	38.62	52.84	22.23	11.64	33.74	23.12	14.02	30.69
Dordieb	-2.05	-2.33	-1.80	50.94	43.78	59.21	24.08	13.53	34.88	26.69	21.04	34.17
Tokar	-2.13	-2.36	-1.88	55.06	46.93	61.15	25.47	14.61	35.31	29.72	21.04	34.36
Agig	-1.59	-1.84	-1.30	42.46	34.71	50.26	20.18	12.22	31.10	21.57	15.31	27.05
Gabaot Elma-aadin	-1.72	-2.05	-1.47	42.13	33.35	52.46	24.28	11.58	37.83	18.35	10.86	26.40
Halaeeb (accessible parts)	-1.65	-1.99	-1.26	43.65	25.78	55.22	26.22	6.87	42.75	17.40	4.97	26.96
Red Sea State	-1.9	-2.18	-1.62	48.38	40.11	56.65	23.58	12.04	35.11	24.83	17.04	32.61
Kassala Town	-1.16	-1.29	-1.02	25.76	20.86	30.44	18.09	11.64	23.79	7.57	4.99	11.61
Refi Kassla	-1.84	-2.04	-1.67	43.51	37.73	49.46	25.54	17.14	34.21	17.95	13.12	23.35
Rural Western Kassala	-2.13	-2.27	-2.01	54.65	48.39	58.44	31.24	24.32	38.16	23.85	18.50	27.15
New Halfa	-1.29	-1.49	-1.11	26.91	21.00	35.73	18.22	11.30	27.17	8.28	4.69	13.46
Refi Nahr Atbara	-1.87	-2.11	-1.65	47.51	39.77	55.71	27.73	17.13	37.50	19.57	13.74	28.20
Rural Khashm Elgirba	-1.67	-1.83	-1.48	40.02	34.26	47.42	27.05	18.39	35.47	13.26	8.87	19.67
Rural Wad Elhilaiw	-1.73	-1.90	-1.56	44.30	37.82	51.65	27.00	18.22	36.34	16.72	12.55	23.22
Rural Aroma	-1.89	-2.07	-1.72	48.88	44.96	56.65	26.62	19.86	35.32	22.61	18.73	27.49
Refi North Delta	-1.95	-2.18	-1.75	49.50	43.11	57.41	24.37	15.82	34.92	25.50	19.00	31.64
Refi Hamashkureib	-2.74	-2.88	-2.62	77.42	72.41	82.44	33.16	25.58	42.43	44.56	37.22	50.70
Rural Telkok	-2.51	-2.69	-2.29	66.46	58.19	75.09	25.57	11.91	37.00	41.03	34.30	49.73

TABLE 2: Mean HAZ and stunting prevalence by locality and by state

Location	Mean HAZ %			HAZ < -2 %			HAZ between -3 and -2 %			HAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kassala State	-1.89	-2.06	-1.71	47.72	41.41	54.03	24.95	16.48	33.42	22.81	17.62	28.01
Gedaref Town	-1.41	-1.63	-1.20	37.77	30.68	43.77	19.62	11.78	28.32	17.86	12.72	23.28
Middle Geddaref	-1.46	-1.77	-1.21	35.95	28.22	47.18	21.67	9.94	34.65	13.99	8.70	23.42
Elbutana	-1.90	-2.07	-1.74	47.79	43.54	53.38	28.08	20.63	35.29	19.98	15.36	24.90
El Fashaga	-2.16	-2.36	-1.87	55.77	49.76	62.37	24.40	15.74	32.40	31.66	26.40	36.86
El Rahad	-1.95	-2.21	-1.70	48.60	42.73	55.20	22.84	15.61	30.34	25.75	21.33	31.88
Gala-a El Nahal	-1.73	-1.93	-1.50	42.69	34.06	49.17	26.10	15.70	36.32	16.76	9.15	22.26
El Fao	-1.79	-2.01	-1.60	45.14	38.42	50.93	21.24	13.61	28.85	23.59	17.80	30.43
El Qureisha	-1.76	-1.97	-1.50	45.21	38.10	48.96	23.72	13.41	30.28	20.91	16.45	26.09
El Mafaza	-1.91	-2.08	-1.70	47.38	43.03	54.21	27.68	20.52	35.52	19.77	14.86	25.81
Basunda	-1.72	-1.98	-1.45	45.98	36.44	52.70	23.29	12.31	33.17	21.98	14.52	27.65
Western Galabat	-1.73	-1.94	-1.48	43.87	33.79	49.05	20.34	8.98	29.83	22.92	16.68	28.15
Eastern Galabat	-1.87	-2.10	-1.65	49.49	42.79	54.41	24.06	16.18	31.72	25.73	20.46	29.85
Al-Gadarif State	-1.76	-1.98	-1.54	45.16	39.03	51.28	23.14	14.73	31.54	21.95	16.37	27.54
Sheikan	-1.56	-1.70	-1.44	34.75	30.94	38.46	23.43	18.19	28.24	11.54	7.74	14.19
Um Rawaba	-1.65	-1.79	-1.50	40.66	35.59	47.01	23.29	16.59	30.87	16.76	12.80	22.06
Um Dam Haj Ahmed	-1.75	-1.90	-1.57	44.40	37.62	48.75	27.17	17.81	34.33	17.13	11.44	22.94
El Rahad	-1.46	-1.64	-1.28	31.87	26.50	37.01	23.37	16.74	28.96	8.41	5.47	12.23
Bara	-1.88	-2.05	-1.66	45.55	38.93	52.90	25.82	17.96	34.80	19.64	15.34	25.85
Gharb Bara	-1.64	-1.83	-1.47	37.65	31.44	44.40	23.80	16.14	31.91	13.77	10.18	18.92
Soudari	-1.80	-1.98	-1.64	46.40	40.54	51.88	22.87	14.94	31.80	23.40	18.36	28.57
Gebrat El Sheikh	-1.74	-1.88	-1.58	44.20	40.42	48.81	25.52	19.62	32.01	18.76	13.97	22.68
North Kordofan State	-1.67	-1.83	-1.5	40.11	35.28	44.94	24.41	17.78	31.03	15.77	11.43	20.12
Kadugli	-1.09	-1.21	-0.94	25.50	20.57	30.23	17.26	11.91	23.12	8.04	5.17	11.58
Reif Shargi	-1.38	-1.51	-1.26	30.15	26.49	35.39	20.76	15.24	27.14	9.67	7.06	12.79
Dilling	-1.55	-1.90	-1.09	38.85	22.76	54.84	22.24	4.99	39.94	15.76	6.42	23.64
El Quoz	-1.71	-1.86	-1.55	40.99	34.85	46.62	25.14	16.91	32.02	15.70	11.00	20.71
Habila	-1.25	-1.42	-1.04	32.50	25.67	38.84	19.74	12.47	26.98	12.68	8.60	16.79
Abassiya	-1.78	-1.95	-1.60	43.75	39.72	48.58	25.52	19.60	32.82	18.49	13.99	23.85
El Rashad	-1.80	-1.97	-1.64	42.58	36.17	47.19	22.50	14.77	30.28	20.08	14.67	24.40
Abu Jubaiha	-1.81	-2.05	-1.63	46.82	36.85	53.47	22.85	10.92	32.64	23.70	16.29	29.69
El Tadamon	-1.92	-2.10	-1.72	46.49	41.15	53.88	26.79	19.50	35.51	19.99	15.11	25.32
Talodi	-1.47	-1.73	-1.26	34.89	21.42	45.84	23.01	5.85	37.82	10.76	4.40	22.27
Ghadeer	-1.65	-1.84	-1.45	40.51	30.77	49.33	22.38	9.11	33.46	18.07	10.72	27.13
El Leri	-1.51	-1.71	-1.31	36.38	30.04	44.43	19.98	11.23	29.15	16.51	11.11	22.14
Abu Karshola	-2.01	-2.27	-1.76	49.44	43.72	55.68	23.37	14.09	33.76	25.74	19.58	34.05
Delami	-1.39	-1.58	-1.13	30.34	25.77	38.33	19.34	12.58	28.57	10.75	7.20	15.77

TABLE 2: Mean HAZ and stunting prevalence by locality and by state

Location	Mean HAZ %			HAZ < -2 %			HAZ between -3 and -2 %			HAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Kordofan State	-1.67	-1.9	-1.44	40.77	31.75	49.79	22.8	12.21	33.39	17.81	11.28	24.35
Abu Zabad	-1.36	-1.60	-1.10	36.26	30.91	40.56	20.78	14.80	26.70	14.95	11.04	18.54
ElKhiwai	-1.53	-1.70	-1.34	39.25	33.77	44.56	22.45	14.05	29.69	16.55	11.59	21.99
Ghubaish	-1.69	-1.90	-1.52	36.80	32.30	44.17	22.45	16.00	29.87	14.55	10.23	19.19
El Nuhud	-1.78	-1.93	-1.64	42.52	39.42	47.72	21.46	16.40	27.80	21.27	18.33	24.84
El Idia	-1.44	-1.59	-1.31	34.07	26.49	38.19	23.43	14.89	30.23	10.48	5.73	14.39
Wad Benda	-1.88	-2.03	-1.74	48.40	44.15	52.98	27.55	22.24	34.12	20.63	15.93	24.88
Lagawa	-1.41	-1.59	-1.18	40.36	34.21	45.87	22.67	14.27	31.93	17.60	11.57	22.25
Elsunut	-1.45	-1.63	-1.23	34.69	29.43	40.99	20.78	13.38	29.14	14.15	9.62	18.77
Keilik	-1.10	-1.25	-0.97	22.77	16.59	26.58	16.47	9.50	22.56	6.13	2.74	9.33
Es Salam	-1.54	-1.67	-1.41	37.07	31.21	41.92	22.17	15.55	27.83	14.86	10.91	18.17
Babanusa	-1.72	-1.86	-1.51	40.71	35.41	47.41	24.51	17.28	32.44	16.71	12.49	20.29
Abyei	-1.36	-1.54	-1.15	29.31	23.93	34.73	20.76	14.60	27.40	8.13	5.26	12.47
El Dibab	-1.09	-1.29	-0.90	27.23	21.25	33.39	18.96	11.01	26.19	8.37	4.15	13.73
El Meiram	-1.09	-1.29	-0.85	19.65	13.02	25.81	14.62	6.21	21.92	4.99	1.87	9.10
West Kordofan State	-1.54	-1.73	-1.36	36.83	31.2	42.46	21.88	15.11	28.65	15.02	10.89	19.16
El Fasher	-1.86	-2.03	-1.72	48.32	43.50	53.08	24.67	18.41	31.55	23.30	18.29	27.11
Tawila	-2.15	-2.28	-2.02	56.24	50.69	59.96	31.26	23.36	37.88	24.72	19.29	29.42
Melit	-1.82	-1.96	-1.66	43.80	37.59	49.67	27.36	20.38	36.56	16.37	10.89	20.54
Um Kadada	-1.78	-1.92	-1.65	46.14	40.43	49.73	23.57	16.89	29.85	22.76	17.85	26.50
Kebkabiya	-1.68	-1.94	-1.45	43.30	37.16	50.96	21.19	13.95	30.42	22.31	14.37	26.97
Kutum	-1.59	-1.74	-1.45	37.31	32.53	41.46	23.37	16.91	29.99	13.92	9.11	18.52
El Mahalha	-1.72	-1.90	-1.56	40.11	34.13	45.91	24.54	16.04	33.14	15.23	10.37	20.85
Saraf Omra	-2.37	-2.59	-2.18	59.87	54.25	66.73	25.81	17.34	35.10	33.64	27.49	39.93
El Serief	-2.06	-2.27	-1.86	52.07	44.88	57.50	28.93	19.24	36.63	22.84	18.13	30.76
Dar Elsalam	-2.25	-2.40	-2.10	61.03	54.58	66.81	32.66	24.03	40.56	28.05	22.53	32.93
Kelemando	-1.79	-1.98	-1.60	44.97	38.28	52.61	26.45	17.51	36.23	18.56	13.01	24.03
El Tawisha	-1.89	-2.03	-1.74	45.30	40.82	51.35	24.61	17.34	32.16	20.80	15.57	26.46
Um Baru	-1.54	-1.80	-1.30	37.90	27.53	49.19	23.04	8.17	34.69	15.50	7.83	25.59
El Lait	-1.49	-1.65	-1.33	34.52	27.90	41.06	22.48	13.91	30.87	11.93	7.65	16.76
ELkuma	-1.10	-1.49	-0.83	28.23	18.63	36.77	17.59	6.68	27.45	10.42	5.25	16.56
El Tina	-1.55	-2.27	-0.79	33.93	1.95	70.74	23.51	-18.19	68.23	7.81	0.00	36.08
Kernoi	-1.59	-1.73	-1.45	39.31	36.07	45.68	22.49	18.32	29.39	16.75	13.56	20.19
North Darfur State	-1.83	-2.07	-1.59	45.8	37.41	54.19	25.07	14.21	35.94	20.66	14.14	27.18
Nyala South	-1.03	-1.17	-0.90	18.10	11.68	23.67	14.78	7.98	21.05	2.98	1.15	5.94
Nyala North	-1.22	-1.54	-0.93	20.07	7.64	35.71	15.99	2.55	31.32	3.81	0.52	10.22

TABLE 2: Mean HAZ and stunting prevalence by locality and by state

Location	Mean HAZ %			HAZ < -2 %			HAZ between -3 and -2 %			HAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Es Salam	-1.54	-1.66	-1.35	36.15	29.41	41.61	24.08	15.69	31.71	11.80	8.06	17.17
El Wihda	-1.45	-1.60	-1.29	29.54	23.33	36.73	21.82	14.18	30.32	7.67	3.82	12.24
Mershing	-1.34	-1.46	-1.19	25.89	19.37	30.50	20.83	13.81	26.75	4.90	2.12	8.18
Beliel	-1.78	-1.90	-1.63	41.37	34.85	46.14	25.89	18.02	32.72	15.54	11.12	20.75
Nitega	-1.25	-1.64	-0.93	29.13	20.81	42.81	18.73	6.21	33.23	10.93	4.94	20.81
Sharg El Jabal (accessible parts)	-2.59	-3.07	-2.09	80.79	39.13	99.99	34.38	-5.66	69.07	44.60	18.05	73.86
Kas	-0.73	-0.91	-0.57	12.64	7.68	17.18	10.26	4.98	15.18	2.43	0.81	4.22
Shattaya	-0.89	-1.04	-0.74	19.21	13.04	24.01	13.71	6.87	19.16	5.36	2.40	8.72
Buram	-0.96	-1.10	-0.84	8.96	5.02	13.98	8.18	4.47	13.08	0.68	0.16	1.60
Gereida	-1.12	-1.29	-0.98	20.76	15.15	26.77	16.52	10.65	22.72	4.10	1.95	7.18
El Sunta	-1.79	-1.99	-1.59	43.85	37.50	50.35	25.66	17.39	34.11	18.22	13.11	23.51
El Radoum	-1.39	-1.57	-1.25	31.08	25.93	35.58	21.16	15.26	26.95	9.70	7.18	14.16
Tulus	-1.17	-1.40	-0.96	24.89	16.16	32.95	16.59	7.16	26.55	7.89	2.78	14.26
Damso	-1.15	-1.34	-0.96	23.50	17.14	31.32	17.39	10.95	25.49	6.10	3.69	10.15
Ed Elfursan	-0.96	-1.10	-0.79	22.82	17.12	27.81	15.76	9.80	21.87	6.83	3.98	9.85
Kubum	-1.44	-1.57	-1.28	37.09	33.11	41.54	23.66	18.79	28.40	13.41	11.15	15.88
Kateila	-0.98	-1.16	-0.82	20.11	14.74	26.09	14.51	8.24	20.70	5.29	2.60	9.97
Rehaid Elbirdi	-0.85	-0.98	-0.74	14.42	10.68	19.48	11.95	7.75	17.35	2.43	0.94	4.57
Um Dafoug	-0.77	-0.86	-0.68	13.09	9.90	17.26	10.77	7.03	15.49	2.11	1.11	3.84
South Darfur State	-1.16	-1.35	-0.96	23.68	16.17	31.19	16.81	8.19	25.42	6.78	2.56	10.99
Abu Jabra	-1.85	-2.06	-1.61	47.79	41.82	52.19	20.31	12.61	27.26	27.42	21.45	33.06
Abu Karinka	-1.43	-1.66	-1.20	37.06	28.73	42.43	21.11	11.45	28.43	16.03	10.20	20.74
Bahr El Arab	-1.33	-1.61	-1.05	35.11	28.43	40.16	18.51	9.29	26.64	16.52	10.48	21.64
Adila	-1.59	-1.83	-1.35	38.25	35.31	42.92	22.42	18.25	26.95	15.99	12.86	19.57
Ed Dain	-1.59	-1.81	-1.32	39.17	31.81	48.42	20.97	10.99	32.31	18.31	12.88	24.44
Assalaya	-1.65	-1.81	-1.50	42.82	36.08	46.25	25.21	17.23	31.83	17.22	12.28	21.13
El Firdous	-1.40	-1.58	-1.21	36.32	30.28	40.79	21.48	14.12	28.45	15.05	9.33	19.32
Shia-ria	-1.41	-1.76	-0.97	39.03	29.17	48.22	16.83	4.30	29.94	22.57	14.10	28.70
Yassin	-1.85	-2.09	-1.58	48.58	40.23	54.85	20.97	11.50	32.74	27.61	18.90	33.15
East Darfur State	-1.54	-1.79	-1.28	39.55	33.92	45.19	21.00	13.03	28.98	18.57	13.06	24.07
El Geneina	-1.49	-1.66	-1.33	40.46	34.96	44.82	21.97	14.62	27.97	18.55	13.89	23.27
Habila	-1.61	-1.76	-1.44	43.81	37.78	47.89	21.30	14.03	27.23	22.49	17.95	26.32
Kulbus	-1.54	-1.78	-1.32	40.72	35.31	45.64	20.04	13.20	26.75	20.76	15.65	25.47
Beida	-1.46	-1.61	-1.31	34.92	29.86	40.77	20.88	13.98	27.84	14.10	10.43	18.31
Foro Baranga	-1.73	-2.06	-1.37	50.42	43.14	54.93	19.93	11.15	30.09	30.44	23.42	35.27
Kereneik	-1.80	-1.96	-1.67	43.96	39.47	48.19	23.64	18.82	29.63	20.25	16.30	23.99
Sirba	-1.74	-1.94	-1.57	42.62	36.10	48.85	22.63	15.16	32.10	18.90	13.36	23.95

TABLE 2: Mean HAZ and stunting prevalence by locality and by state

Location	Mean HAZ %			HAZ < -2 %			HAZ between -3 and -2 %			HAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Jebel Moon	-1.42	-1.71	-1.15	38.75	27.96	43.84	22.58	12.49	30.62	16.34	9.78	20.32
West Darfur State	-1.57	-1.78	-1.36	41.45	35.95	46.95	21.86	14.31	29.41	19.62	14.79	24.45
Zalingi	-1.61	-1.77	-1.49	39.70	35.47	44.68	22.83	17.15	29.31	16.75	13.68	20.67
Wadi Salih	-1.44	-1.77	-1.17	39.68	31.94	47.39	18.65	8.34	30.13	20.37	14.08	28.02
Mukjar	-1.02	-1.28	-0.82	31.19	24.68	36.66	15.78	7.99	23.43	14.95	9.82	19.79
Central Jebel Mara	-2.21	-2.65	-1.78	58.39	47.09	75.98	23.66	4.90	43.66	34.76	26.03	48.35
North Jebel Mara	-2.34	-2.68	-1.99	56.09	44.70	64.91	24.62	10.09	41.08	31.22	18.13	40.59
Bendasi	-1.33	-1.50	-1.17	26.78	19.21	34.82	19.24	9.86	27.31	7.44	3.68	13.37
Nertiti	-2.00	-2.28	-1.73	51.45	47.38	57.57	22.34	14.41	30.58	29.10	24.82	36.04
Azum	-1.39	-1.59	-1.12	31.67	24.08	36.62	20.40	11.16	27.87	11.28	5.43	15.40
Um Dukhun	-1.67	-1.91	-1.40	41.65	38.06	46.99	20.97	12.97	28.92	20.91	15.25	26.32
Central Darfur State	-1.65	-1.94	-1.36	41.95	32.56	51.34	20.96	9.2	32.71	20.93	12.62	29.24

Spatial distribution of stunting

Figures 8 to 15 show the spatial distribution of stunting.

FIGURE 8:
Child: Mean HAZ (raster)

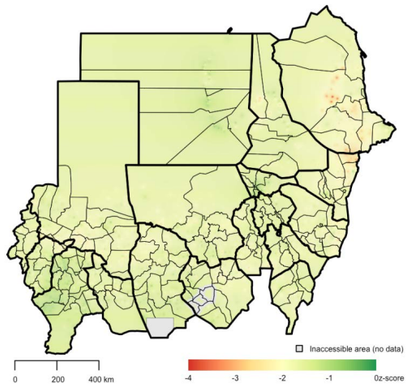


FIGURE 9:
Child: Mean HAZ

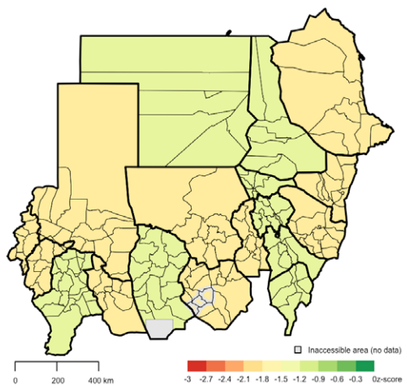


FIGURE 10:
Child: HAZ < -2 (raster)

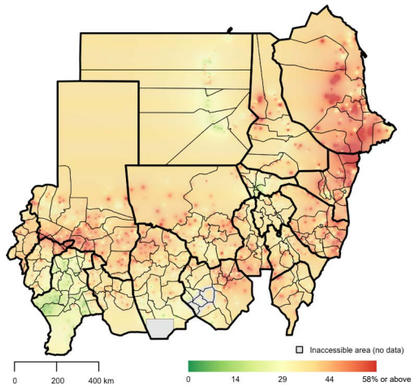


FIGURE 11:
Child: HAZ < -2

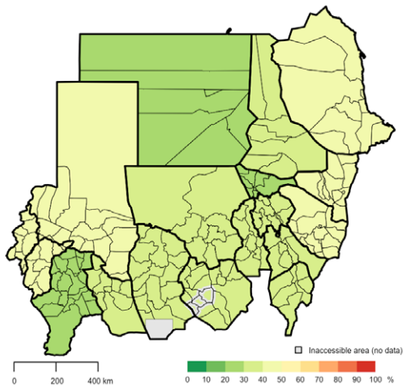


FIGURE 12:
Child: HAZ between -3 and -2 (raster)

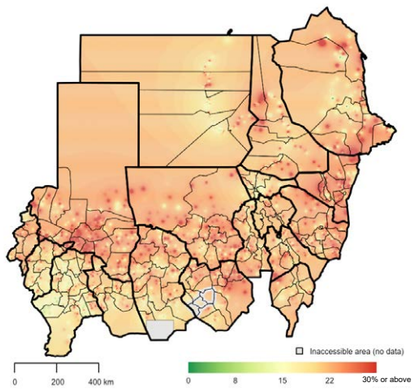


FIGURE 13:
Child: HAZ between -3 and -2

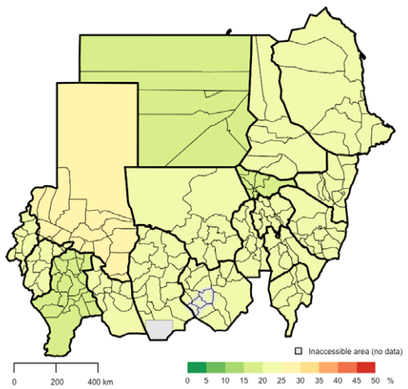


FIGURE 14:
Child: HAZ < - 3 (raster)

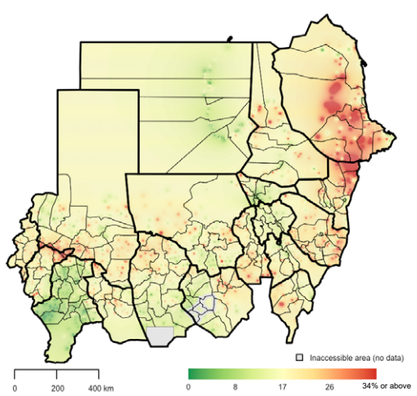
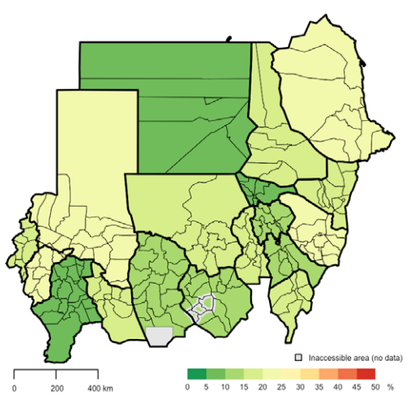


FIGURE 15:
Child: HAZ < - 3



3.1.2 Underweight

Underweight average results

The **mean weight-for-age Z-score (WAZ)** of children 6-59 months old in Sudan was -1.41 (95 per cent CI: -1.59–1.24) Z-score. Among the states, the mean WAZ was highest in Khartoum state at -1.19 (95 per cent CI: -1.37–1.01) Z-score, while Red Sea state had the lowest mean WAZ at -2.02 (95 per cent CI: -2.22–1.81) *(see Figure 16).*

Among the localities, Um Dafoug locality in South Darfur state had the highest mean WAZ at -0.93 (95 per cent CI: -1.03–0.81). Shia-ria locality in East Darfur state and Sinkat, Haya and Tokar locality in Red Sea state had the lowest mean WAZ of all localities *(see Figure 16).*

Global underweight prevalence was at at 29.16 per cent (95 per cent CI: 22.05-36.27 per cent).
Moderate underweight prevalence was 21.14 per cent (95 per cent CI: 12.82-29.45 per cent).
Severe underweight prevalence was at 7.93 per cent (95 per cent CI: 3.43 – 12.42 per cent).

Among the states, Red Sea state had the highest prevalence of global and severe underweight. while North Darfur had the highest prevalence of moderate underweight. On the other hand, Blue Nile state had the lowest prevalence of global and moderate underweight, and South Darfur had the lowest prevalence of severe underweight *(see Figure17).*

There is great inter-locality variability within Kassala, South Darfur and Red Sea states, where outlier localities face extremely high prevalences of underweight. Khartoum state contains outlier localities with low prevalences of underweight *(see Figure 17).* Of all the localities, 89.4 per cent had global underweight prevalences greater than 20 per cent.

Table 3 and Table 4 present results per locality, per state and national for mean WAZ and for prevalence of global, moderate and severe underweight.

FIGURE 16: Box plot of state and locality results for mean WAZ

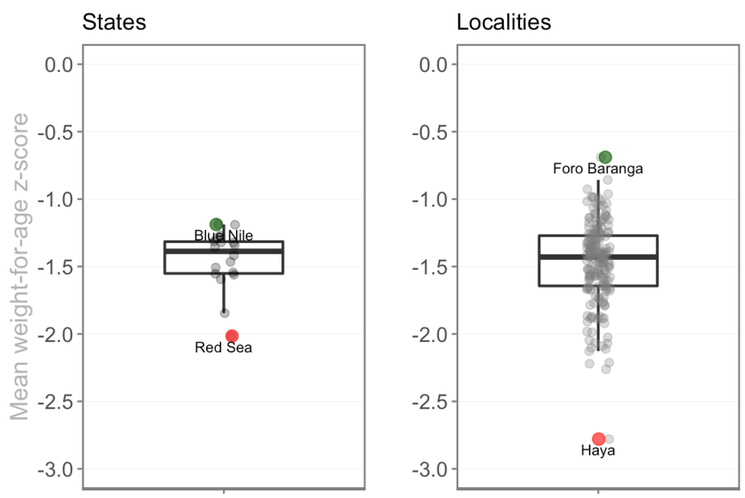


FIGURE 17: Box plot of state results of child underweight by WAZ

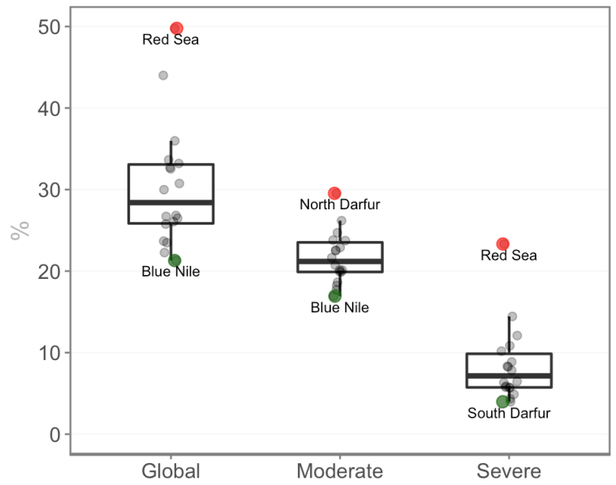
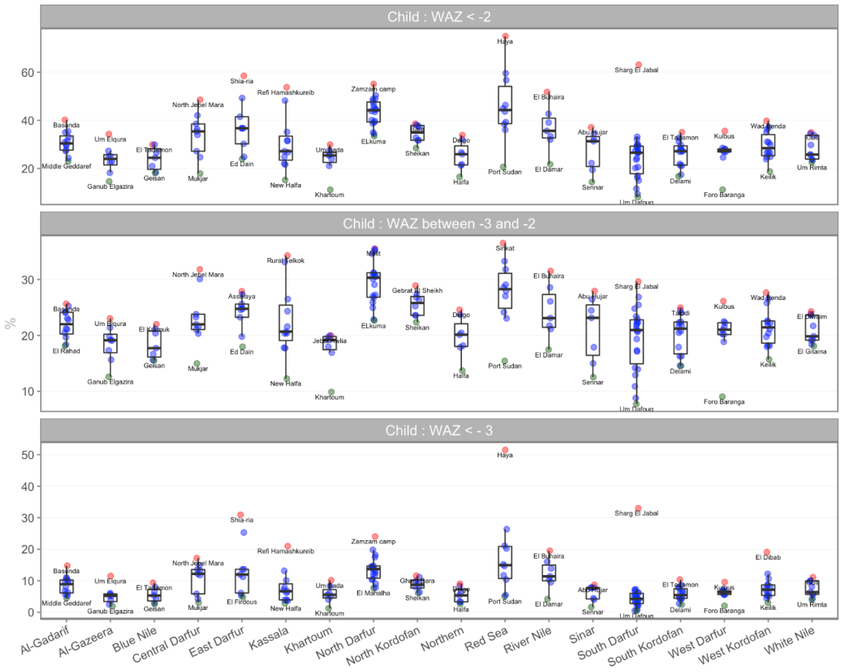


FIGURE 18: Box plot of locality results of child underweight by WAZ



Underweight comparison between S3M I and S3M II

Comparing S3M I with S3M II results, it was found that underweight prevalence increased significantly in four states: Northern (from 14.9 per cent in 2013 to 26.8 per cent); River Nile (from 23 per cent in 2013 to 33.2 per cent); Khartoum (from 15.6 per cent in 2013 to 23.5 per cent); and West Darfur (from 22.3 per cent in 2013 to 26.7 per cent).

The underweight prevalence significantly decreased in the states of Blue Nile (from 37.7 per cent in 2013 to 21.3 per cent) and Kassala (from 49.1 per cent in 2013 to 32.7 per cent).

TABLE 3: Mean WAZ and underweight prevalence by state and national

State	Mean WAZ %			WAZ < -2 %			WAZ between -3 and -2 %			WAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	-1.42	-1.60	-1.24	29.98	23.87	36.08	21.64	13.98	29.30	8.26	3.81	12.72
Al-Gazeera	-1.27	-1.42	-1.12	23.68	16.57	30.79	18.64	10.88	26.40	4.88	1.63	8.12
Blue Nile	-1.19	-1.33	-1.04	21.30	15.67	26.94	16.93	10.56	23.30	4.34	1.59	7.10
Central Darfur	-1.56	-1.80	-1.32	33.64	26.40	40.89	22.57	12.62	32.52	10.84	4.85	16.82
East Darfur	-1.60	-1.80	-1.39	35.97	29.47	42.47	23.73	15.51	31.96	12.10	7.03	17.17
Kassala	-1.51	-1.67	-1.35	32.71	25.82	39.60	23.80	15.74	31.86	8.86	4.44	13.27
Khartoum	-1.19	-1.37	-1.01	23.48	16.59	30.37	17.70	10.07	25.33	5.75	2.00	9.50
North Darfur	-1.85	-2.05	-1.64	44.01	33.47	54.56	29.54	17.30	41.79	14.44	7.25	21.64
North Kordofan	-1.55	-1.68	-1.43	32.55	27.30	37.81	24.71	18.55	30.86	7.84	4.84	10.85
Northern	-1.36	-1.54	-1.17	26.82	18.88	34.76	20.73	12.12	29.34	5.73	2.10	9.36
Red Sea	-2.02	-2.22	-1.81	49.77	40.16	59.38	26.19	13.37	39.01	23.33	14.31	32.35
River Nile	-1.54	-1.76	-1.33	33.20	25.91	40.48	22.89	13.94	31.85	10.19	5.06	15.31
Sennar	-1.32	-1.48	-1.17	25.78	19.33	32.23	19.92	12.98	26.86	5.67	2.50	8.83
South Darfur	-1.29	-1.45	-1.13	22.27	16.14	28.39	18.22	11.38	25.06	3.97	0.71	7.22
South Kordofan	-1.32	-1.50	-1.14	26.07	19.21	32.93	20.15	12.25	28.05	5.88	2.41	9.35
West Darfur	-1.34	-1.52	-1.16	26.71	19.72	33.70	20.12	12.39	27.85	6.32	2.86	9.79
West Kordofan	-1.47	-1.62	-1.31	30.74	24.46	37.02	22.50	14.73	30.26	8.32	3.98	12.67
White Nile	-1.31	-1.48	-1.15	26.49	20.28	32.70	19.89	12.50	27.28	6.46	2.93	10.00
Sudan	-1.41	-1.59	-1.24	29.16	22.05	36.27	21.14	12.82	29.45	7.93	3.43	12.42

TABLE 4: Mean WAZ and underweight prevalence by locality and by state

Location	Mean WAZ %			WAZ < -2 %			WAZ between -3 and -2 %			WAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	-1.40	-1.57	-1.23	28.41	21.42	33.71	21.02	13.46	28.08	6.84	3.74	10.83
El Golid	-1.33	-1.47	-1.19	22.04	15.96	28.78	18.43	11.84	26.25	3.37	1.47	6.19
Merwoe	-1.44	-1.62	-1.26	31.75	22.75	37.39	24.30	14.02	31.07	7.56	3.69	11.18
El Daba	-1.33	-1.53	-1.09	25.87	14.58	32.76	20.01	8.65	27.79	5.01	1.92	9.33
Halfa	-1.07	-1.19	-0.96	18.22	14.38	23.10	15.05	10.91	20.08	3.26	1.60	5.38
Delgo	-1.62	-1.80	-1.45	32.54	27.98	39.83	23.95	16.82	31.88	8.87	5.38	13.88
El Burgaig	-1.19	-1.38	-1.02	21.34	16.60	28.91	17.84	11.80	24.65	3.58	1.91	6.83
Northern State	-1.36	-1.54	-1.17	26.82	18.88	34.76	20.73	12.12	29.34	5.73	2.10	9.36
El Matama	-1.68	-1.86	-1.50	37.12	30.23	43.90	27.22	18.89	36.01	9.71	5.83	14.40
Shendi	-1.87	-2.04	-1.68	43.26	37.42	51.04	28.48	21.65	37.55	14.29	10.24	19.28
Abu Hamad	-1.69	-2.00	-1.40	42.53	32.80	55.48	23.05	9.89	37.04	20.42	11.59	29.81
Barbar	-1.43	-1.70	-1.10	35.00	26.04	43.39	22.93	11.95	33.47	11.25	6.84	17.85
El Damar	-1.24	-1.37	-1.13	20.53	16.77	26.51	17.02	12.71	22.83	3.55	2.13	6.63
Atbara	-1.22	-1.37	-1.09	21.18	17.38	27.21	16.78	12.22	23.38	4.25	2.81	6.96
El Buhaira	-1.93	-2.14	-1.75	52.21	46.98	55.45	32.18	26.90	37.09	19.36	15.84	22.31
River Nile State	-1.54	-1.76	-1.33	33.20	25.91	40.48	22.89	13.94	31.85	10.19	5.06	15.31
Khartoum	-0.93	-1.08	-0.77	10.10	6.65	15.38	8.97	5.53	14.24	0.94	0.31	2.78
Bahri	-1.15	-1.35	-0.97	20.94	14.91	26.00	16.68	9.85	22.85	3.94	1.69	7.07
Um Durman	-1.25	-1.48	-1.03	27.01	20.43	33.97	18.98	11.69	27.13	8.14	4.41	12.19
Um Bada	-1.13	-1.28	-0.98	27.64	20.56	34.10	19.11	10.62	26.67	8.41	4.28	13.08
Jebel Awlia	-1.31	-1.52	-1.11	24.62	17.08	32.77	19.20	10.84	27.76	5.09	2.01	10.01
Sharg Elneel	-1.18	-1.38	-1.00	24.48	17.37	30.91	18.55	10.67	25.12	6.14	2.71	9.51
Karrari	-1.36	-1.52	-1.22	27.09	21.21	34.02	20.38	13.03	28.54	6.59	3.15	10.91
Khartoum State	-1.19	-1.37	-1.01	23.48	16.59	30.37	17.70	10.07	25.33	5.75	2.00	9.50
Greater Medani	-1.11	-1.26	-0.96	17.84	11.37	23.67	15.06	9.26	21.80	2.56	0.99	4.75
Ganub Elgazira	-1.03	-1.17	-0.88	17.40	11.43	24.86	14.73	7.75	22.44	2.70	1.18	6.34
El Hassahisa	-1.41	-1.54	-1.25	28.42	22.16	36.53	22.29	15.21	30.47	6.23	3.32	10.23
El Kamlin	-1.29	-1.41	-1.18	22.96	17.45	27.07	19.10	13.24	23.47	3.83	1.91	5.74
Sharg El Gezira	-1.30	-1.50	-1.11	25.40	19.03	32.66	18.83	11.40	27.25	6.24	3.35	10.17
Um Elqura	-1.59	-1.79	-1.39	34.15	26.24	42.36	23.75	15.12	33.31	10.14	5.55	15.57
El Manaqil	-1.23	-1.39	-1.08	22.27	17.43	29.58	17.31	10.87	24.07	4.87	2.87	8.87
El Qurashi	-1.42	-1.53	-1.28	25.59	19.94	31.15	20.32	13.62	26.69	5.31	2.77	8.60
Al-Gazeera State	-1.27	-1.42	-1.12	23.68	16.57	30.79	18.64	10.88	26.40	4.88	1.63	8.12
Sennar	-1.01	-1.17	-0.89	15.70	11.06	20.61	13.61	8.20	18.86	2.02	0.79	4.23
Sharg Sennar	-1.52	-1.68	-1.40	31.45	26.52	37.30	23.38	16.58	30.90	7.89	5.32	12.02

TABLE 4: Mean WAZ and underweight prevalence by locality and by state

Location	Mean WAZ %			WAZ < -2 %			WAZ between -3 and -2 %			WAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sinja	-0.99	-1.15	-0.83	19.82	14.68	23.72	15.26	10.12	19.76	4.50	2.63	6.23
Abu Hujar	-1.58	-1.78	-1.37	32.30	26.76	40.20	25.10	17.95	33.51	7.40	4.93	11.57
El Dali	-1.64	-1.84	-1.49	34.67	28.25	43.42	24.89	15.71	35.05	10.22	5.30	15.20
Es Suki	-1.26	-1.40	-1.12	23.38	17.33	30.65	18.66	12.27	27.21	4.45	2.18	7.28
Ed Dinder	-1.61	-1.77	-1.43	34.65	26.07	41.23	26.37	16.54	33.55	8.50	3.90	13.06
Sennar State	-1.32	-1.48	-1.17	25.78	19.33	32.23	19.92	12.98	26.86	5.67	2.50	8.83
Ed Damazine	-1.04	-1.23	-0.88	15.49	10.73	22.48	13.42	8.30	20.49	2.05	0.91	4.81
El Tadamon	-1.40	-1.58	-1.25	30.19	24.20	37.28	20.58	13.47	28.65	9.50	5.86	13.45
El Roseiris	-1.12	-1.22	-1.02	21.07	15.88	24.54	16.53	11.39	20.69	4.36	2.51	6.26
Baw	-1.03	-1.16	-0.92	18.11	12.46	22.45	14.76	9.07	20.24	2.91	1.18	4.92
Geisan	-1.23	-1.40	-1.07	18.33	12.48	25.93	15.93	9.39	24.31	2.44	0.70	5.43
El Kurmuk	-1.44	-1.61	-1.26	30.19	20.28	35.51	22.11	12.17	29.63	7.97	3.15	12.78
Wad El Mahi	-1.34	-1.45	-1.24	24.27	18.60	27.84	19.61	13.79	23.75	4.71	2.86	6.35
Blue Nile State	-1.19	-1.33	-1.04	21.30	15.67	26.94	16.93	10.56	23.30	4.34	1.59	7.10
Kosti	-1.24	-1.43	-1.08	23.25	17.98	28.69	18.60	12.68	24.66	4.38	2.38	7.48
Guli	-1.58	-1.74	-1.44	34.47	27.21	39.73	22.97	14.20	29.55	11.19	6.38	15.96
Tendalti	-1.22	-1.37	-1.08	23.75	16.90	29.13	18.70	10.73	24.74	4.89	2.01	8.48
Es Salam	-1.59	-1.76	-1.43	34.44	27.66	39.25	23.71	15.87	30.58	10.61	6.55	14.40
Rabak	-1.21	-1.31	-1.09	23.27	18.33	29.08	18.28	13.14	24.60	4.79	2.54	8.56
El Jabalain	-1.29	-1.47	-1.12	23.95	16.96	31.80	18.37	10.55	27.60	5.16	2.43	8.74
El Diwaim	-1.53	-1.74	-1.34	34.71	26.09	43.40	24.23	14.12	33.58	10.59	5.11	15.63
Um Rimta	-1.21	-1.39	-1.05	22.88	15.69	28.73	18.95	11.12	25.06	3.81	1.61	6.81
El Gitaina	-1.11	-1.27	-0.97	23.58	18.02	30.37	17.31	11.27	24.62	5.79	3.27	9.09
White Nile State	-1.31	-1.48	-1.15	26.49	20.28	32.70	19.89	12.50	27.28	6.46	2.93	10.00
Port Sudan	-1.19	-1.37	-1.02	23.66	15.86	31.14	17.36	8.60	25.54	6.29	2.53	10.70
Swakin	-1.68	-1.91	-1.48	36.28	25.52	44.35	26.76	12.90	37.09	9.48	4.25	17.21
El Gonob Welawlaib	-2.01	-2.17	-1.83	44.25	40.57	51.91	31.53	24.39	39.80	13.12	9.17	19.82
Sinkat	-2.22	-2.35	-2.09	56.74	50.39	62.01	35.84	26.34	44.54	21.24	13.30	27.09
Haya	-2.76	-3.03	-2.48	73.49	61.12	86.64	21.93	4.86	40.64	50.98	39.45	63.47
Dordieb	-2.13	-2.53	-1.69	47.23	37.30	59.81	24.89	4.47	43.15	23.04	12.93	40.42
Tokar	-2.27	-2.44	-2.10	60.11	52.76	65.77	33.80	25.60	41.67	26.40	21.79	30.89
Agig	-1.74	-1.93	-1.52	38.47	31.58	45.42	26.28	18.81	35.62	11.91	7.94	16.49
Gabaot Elma-aadin	-1.65	-1.88	-1.42	37.99	29.44	53.68	27.37	17.51	42.29	10.69	7.06	17.87
Halaeeb (accessible parts)	-1.71	-1.93	-1.46	42.03	23.65	58.04	27.82	10.49	43.46	13.65	3.99	21.21

TABLE 4: Mean WAZ and underweight prevalence by locality and by state

Location	Mean WAZ %			WAZ < -2 %			WAZ between -3 and -2 %			WAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Red Sea State	-2.02	-2.22	-1.81	49.77	40.16	59.38	26.19	13.37	39.01	23.33	14.31	32.35
Kassala Town	-1.21	-1.34	-1.08	21.37	17.36	27.28	17.66	12.98	23.85	3.73	2.03	5.99
Refi Kassla	-1.54	-1.66	-1.43	30.70	25.36	37.16	23.92	18.36	31.28	6.67	4.07	10.33
Rural Western Kassala	-1.41	-1.53	-1.27	25.76	21.22	30.70	21.20	15.76	26.98	4.25	2.31	7.14
New Halfa	-0.94	-1.09	-0.76	15.41	10.83	20.18	12.69	7.21	17.64	2.71	1.28	4.86
Refi Nahr Atbara	-1.38	-1.56	-1.22	27.12	18.59	34.03	20.60	10.45	28.76	6.59	2.93	11.11
Rural Khashm Elgirba	-1.22	-1.36	-1.09	21.79	15.71	27.57	17.65	11.58	24.22	3.91	1.53	6.63
Rural Wad Elhilaiw	-1.39	-1.56	-1.24	29.58	23.82	35.47	22.57	15.54	28.99	6.86	3.95	10.30
Rural Aroma	-1.67	-1.85	-1.54	39.49	30.35	46.89	29.70	19.61	38.61	9.39	5.25	14.48
Refi North Delta	-1.45	-1.68	-1.26	31.65	23.52	39.42	21.32	12.02	31.07	10.19	5.81	16.39
Refi Hamashkureib	-2.16	-2.34	-2.00	55.29	46.65	62.34	34.26	25.36	44.05	21.24	14.29	26.54
Rural Telkok	-1.88	-2.04	-1.72	48.28	37.78	55.80	34.17	22.53	44.56	13.46	8.30	19.96
Kassala State	-1.51	-1.67	-1.35	32.71	25.82	39.60	23.80	15.74	31.86	8.86	4.44	13.27
Gedaref Town	-1.40	-1.57	-1.21	29.27	19.79	38.12	21.20	9.83	30.87	8.24	3.71	14.12
Middle Geddaref	-1.24	-1.43	-1.06	23.17	16.94	29.53	18.66	11.76	25.35	4.52	2.59	8.47
Elbutana	-1.62	-1.76	-1.47	35.34	30.96	39.22	25.45	20.42	30.05	9.78	6.75	12.70
El Fashaga	-1.45	-1.57	-1.32	35.14	30.03	40.68	23.94	17.37	30.39	10.91	7.44	14.81
El Rahad	-1.17	-1.33	-1.02	24.15	19.42	29.57	17.68	11.94	23.88	6.35	3.55	9.35
Gala-a El Nahal	-1.37	-1.59	-1.22	25.23	17.40	33.80	20.31	11.80	29.54	4.61	2.50	9.25
El Fao	-1.52	-1.71	-1.36	32.56	26.58	38.50	20.48	12.36	28.38	11.93	6.39	17.09
El Qureisha	-1.28	-1.40	-1.16	25.95	21.57	31.08	18.93	14.00	24.31	6.88	4.32	9.65
El Mafaza	-1.51	-1.68	-1.37	29.62	24.83	35.65	23.35	17.93	29.54	6.23	3.75	9.19
Basunda	-1.53	-1.80	-1.28	38.85	28.97	45.75	25.20	14.18	33.58	13.94	8.70	19.81
Western Galabat	-1.57	-1.72	-1.40	33.10	26.05	40.40	23.15	14.82	31.25	9.85	5.19	15.24
Eastern Galabat	-1.44	-1.60	-1.31	29.78	25.66	32.95	22.56	17.76	26.91	7.08	4.74	10.29
Al-Gadarif State	-1.42	-1.60	-1.24	29.98	23.87	36.08	21.64	13.98	29.30	8.26	3.81	12.72
Sheikan	-1.47	-1.57	-1.37	28.30	25.17	31.55	22.53	18.56	26.22	5.72	4.04	8.05
Um Rawaba	-1.49	-1.61	-1.39	31.19	26.85	35.97	23.48	17.80	29.16	8.01	5.08	10.95
Um Dam Haj Ahmed	-1.61	-1.76	-1.43	34.17	28.41	40.64	25.99	19.55	33.45	8.20	4.41	12.51
El Rahad	-1.45	-1.59	-1.34	27.92	22.47	34.37	22.99	16.52	29.66	4.88	2.39	7.97
Bara	-1.70	-1.89	-1.56	37.31	28.73	43.11	27.26	17.90	34.12	10.18	5.74	15.09
Gharb Bara	-1.61	-1.75	-1.46	37.30	30.71	42.09	26.85	19.14	33.07	10.18	6.72	14.30

TABLE 4: Mean WAZ and underweight prevalence by locality and by state

Location	Mean WAZ %			WAZ < -2 %			WAZ between -3 and -2 %			WAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Soudari	-1.60	-1.73	-1.46	34.54	30.29	40.95	25.30	19.17	32.12	9.28	6.61	12.57
Gebrat El Sheikh	-1.67	-1.79	-1.56	37.20	32.90	41.32	28.18	23.27	33.30	8.95	6.40	11.42
North Kordofan State	-1.55	-1.68	-1.43	32.55	27.30	37.81	24.71	18.55	30.86	7.84	4.84	10.85
Kadugli	-1.04	-1.13	-0.94	17.48	13.45	21.28	14.57	10.58	18.73	2.76	1.62	4.44
Reif Shargi	-1.35	-1.47	-1.22	26.28	20.23	30.71	21.61	15.65	26.48	4.31	2.32	6.93
Dilling	-1.19	-1.50	-0.91	22.37	10.02	34.10	17.72	3.91	28.73	4.91	0.59	9.75
El Quoz	-1.38	-1.51	-1.21	26.20	20.14	31.99	21.00	13.71	27.92	4.99	1.90	9.21
Habila	-1.09	-1.22	-0.95	20.18	15.79	24.43	16.30	11.96	20.93	3.78	2.17	5.52
Abassiya	-1.25	-1.41	-1.13	28.78	25.22	32.75	21.19	16.47	25.70	7.61	5.13	10.55
El Rashad	-1.35	-1.53	-1.19	27.44	19.81	32.11	20.57	12.43	27.10	6.68	3.30	9.58
Abu Jubaiha	-1.41	-1.58	-1.27	25.30	20.19	36.88	20.16	12.16	31.75	5.40	3.12	10.55
El Tadamon	-1.56	-1.68	-1.43	34.25	28.48	39.98	24.54	17.96	30.91	9.74	5.94	13.16
Talodi	-1.49	-1.74	-1.20	31.22	23.55	38.28	25.31	16.44	34.14	6.22	1.65	11.39
Ghadeer	-1.55	-1.69	-1.39	32.52	25.17	41.34	23.53	16.22	31.43	8.59	4.78	13.12
El Leri	-1.15	-1.32	-1.01	21.49	15.76	27.02	16.60	10.67	22.43	4.83	2.52	8.37
Abu Karshola	-1.40	-1.60	-1.16	27.69	20.65	34.35	21.30	12.56	28.89	6.52	2.63	10.76
Delami	-1.04	-1.20	-0.78	16.87	11.89	21.47	14.39	9.37	19.51	2.45	0.71	4.62
South Kordofan State	-1.32	-1.50	-1.14	26.07	19.21	32.93	20.15	12.25	28.05	5.88	2.41	9.35
Abu Zabad	-1.38	-1.51	-1.24	28.39	24.24	33.18	21.08	16.15	27.35	7.21	4.52	10.49
ElKhiwai	-1.42	-1.55	-1.30	30.62	25.00	34.51	22.64	16.33	26.97	8.05	4.78	11.02
Ghubaish	-1.50	-1.67	-1.33	32.91	25.57	40.43	22.93	13.71	32.50	9.96	5.31	15.68
El Nuhud	-1.71	-1.82	-1.61	35.04	29.89	43.88	24.33	17.85	33.13	10.80	7.33	15.06
El Idia	-1.39	-1.51	-1.27	26.20	20.98	30.83	21.85	15.04	27.06	4.31	2.21	7.98
Wad Benda	-1.73	-1.88	-1.56	39.96	34.76	46.30	27.92	20.36	35.75	12.20	8.71	17.28
Lagawa	-1.28	-1.43	-1.12	29.66	24.40	33.96	21.96	16.14	26.99	7.45	4.95	10.68
Elsunut	-1.34	-1.53	-1.15	28.45	20.24	36.69	20.70	10.49	30.00	7.72	3.76	13.80
Keilik	-1.11	-1.20	-1.03	19.03	15.20	23.54	15.86	11.54	20.33	3.05	1.71	4.61
Es Salam	-1.24	-1.36	-1.12	24.85	19.33	29.87	19.48	13.70	25.26	5.14	3.11	8.05
Babanusa	-1.55	-1.66	-1.43	34.32	27.15	39.00	26.02	18.64	31.92	8.27	4.38	11.45
Abyei	-1.31	-1.45	-1.17	24.39	17.07	29.58	18.58	10.15	24.96	5.52	2.76	9.03
El Dibab	-1.39	-1.66	-1.13	33.12	22.62	40.81	20.46	6.81	31.66	11.88	5.96	21.31
El Meiram	-1.27	-1.44	-1.09	24.96	17.05	30.45	18.13	9.68	25.72	6.16	1.59	10.78
West Kordofan State	-1.47	-1.62	-1.31	30.74	24.46	37.02	22.50	14.73	30.26	8.32	3.98	12.67

TABLE 4: Mean WAZ and underweight prevalence by locality and by state

Location	Mean WAZ %			WAZ < -2 %			WAZ between -3 and -2 %			WAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Fasher	-1.96	-2.09	-1.82	49.68	44.70	54.85	29.06	23.39	35.54	20.53	17.05	24.40
Tawila	-1.84	-1.98	-1.72	42.63	37.74	48.05	30.15	22.44	38.57	12.09	8.11	17.00
Melit	-2.01	-2.15	-1.87	51.97	45.52	56.95	36.15	28.49	42.75	15.65	11.04	19.60
Um Kadada	-1.68	-1.81	-1.55	38.55	33.45	44.92	26.14	18.60	33.05	12.45	8.69	18.29
Kebkabiya	-1.76	-1.91	-1.60	39.00	32.08	45.55	24.36	14.14	32.24	14.74	9.00	22.93
Kutum	-1.74	-1.85	-1.63	38.19	31.96	44.95	29.39	23.05	35.98	8.38	5.25	12.25
El Mahalha	-1.87	-2.01	-1.75	43.27	36.50	48.37	35.37	26.30	42.56	8.04	3.64	14.63
Saraf Omra	-1.90	-2.10	-1.76	46.76	38.51	54.77	28.81	18.47	38.36	17.59	10.80	24.38
El Serief	-1.79	-1.93	-1.68	43.43	38.70	46.57	29.77	23.02	35.23	13.33	9.20	17.34
Dar Elsalam	-2.07	-2.19	-1.96	48.90	40.68	54.68	34.19	25.18	41.27	14.88	11.10	20.16
Kelemando	-1.87	-2.01	-1.72	45.08	39.88	52.17	32.52	25.79	40.27	12.21	9.06	16.94
El Tawisha	-1.88	-1.99	-1.74	44.30	39.21	49.19	30.61	24.51	35.48	13.90	10.36	18.13
Um Baru	-1.57	-1.76	-1.29	36.33	27.27	40.55	25.86	16.06	33.29	10.19	4.42	16.21
El Lait	-1.69	-1.87	-1.52	39.88	32.05	45.78	27.93	19.18	34.19	12.45	8.11	15.94
ELkuma	-1.42	-1.75	-1.21	33.86	25.12	44.38	23.42	12.24	34.99	10.15	5.15	16.90
El Tina	-1.93	-2.58	-1.22	45.58	7.21	93.41	23.64	-24.35	74.60	21.14	0.00	51.02
Kernoi	-1.74	-1.83	-1.65	36.51	33.03	40.90	28.38	24.18	32.68	8.22	6.01	10.69
North Darfur State	-1.85	-2.05	-1.64	44.01	33.47	54.56	29.54	17.30	41.79	14.44	7.25	21.64
Nyala South	-1.42	-1.54	-1.31	24.64	19.70	32.02	20.95	15.25	28.34	3.49	1.71	6.96
Nyala North	-1.56	-1.81	-1.34	29.54	22.48	42.32	24.33	14.78	35.67	5.25	1.90	11.36
Es Salam	-1.49	-1.63	-1.35	28.41	23.87	33.49	22.83	17.30	28.57	5.53	3.47	8.87
El Wihda	-1.48	-1.62	-1.33	32.48	23.56	37.99	25.73	15.96	32.15	6.33	2.90	10.64
Mershing	-1.43	-1.56	-1.27	26.05	18.94	31.00	22.02	14.85	27.53	3.95	1.73	6.64
Beliel	-1.52	-1.63	-1.43	27.68	22.92	32.48	22.74	17.64	28.02	4.69	2.46	7.42
Nitega	-1.39	-1.64	-1.14	28.78	18.42	37.34	21.35	8.82	30.80	7.81	2.42	13.50
Sharg El Jabal (accessible parts)	-2.04	-2.78	-1.12	62.80	33.51	91.96	30.31	-5.57	66.12	32.25	8.58	59.06
Kas	-1.15	-1.29	-1.02	16.00	10.60	23.05	13.71	7.85	20.62	2.20	0.91	4.94
Shattaya	-1.42	-1.55	-1.29	24.70	18.95	30.45	20.39	14.00	26.22	4.29	2.12	7.49
Buram	-1.06	-1.19	-0.91	11.60	7.54	16.36	10.69	6.66	15.49	0.73	0.31	1.77
Gereida	-1.20	-1.35	-1.05	20.00	15.33	23.53	17.08	12.39	20.87	2.89	1.46	4.87
El Sunta	-1.47	-1.63	-1.28	30.23	23.42	36.80	24.33	16.82	31.12	5.80	2.83	9.44
El Radoum	-1.28	-1.45	-1.14	20.97	16.75	26.74	17.57	12.78	23.85	3.24	1.73	5.60
Tulus	-1.27	-1.45	-1.11	23.47	16.63	33.18	19.23	10.33	29.36	3.88	1.02	10.97
Damso	-1.38	-1.54	-1.23	28.03	22.85	33.09	21.90	15.77	27.48	6.22	3.19	8.99

TABLE 4: Mean WAZ and underweight prevalence by locality and by state

Location	Mean WAZ %			WAZ < -2 %			WAZ between -3 and -2 %			WAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ed Elfursan	-1.01	-1.13	-0.89	15.27	11.96	19.46	12.94	9.59	17.70	2.10	1.03	3.58
Kubum	-1.41	-1.51	-1.32	29.35	24.68	32.75	22.30	17.31	26.60	7.03	4.56	9.29
Kateila	-1.13	-1.30	-0.97	17.24	10.00	23.26	14.51	7.13	21.39	2.78	0.84	5.50
Rehaid Elbirdi	-0.99	-1.09	-0.89	9.47	5.91	13.09	8.87	5.43	12.39	0.58	0.17	1.43
Um Dafoug	-0.93	-1.04	-0.82	8.12	4.99	11.71	7.68	4.52	11.28	0.43	0.13	1.03
South Darfur State	-1.29	-1.45	-1.13	22.27	16.14	28.39	18.22	11.38	25.06	3.97	0.71	7.22
Abu Jabra	-1.66	-1.78	-1.50	36.76	29.15	42.71	24.76	16.18	31.46	12.28	7.36	16.46
Abu Karinka	-1.36	-1.57	-1.16	29.51	22.87	33.74	22.74	15.16	28.37	6.44	3.83	9.67
Bahr El Arab	-1.53	-1.75	-1.30	36.87	31.05	44.02	22.92	15.67	32.43	13.72	9.21	19.74
Adila	-1.58	-1.75	-1.40	36.67	30.82	43.12	25.46	18.28	32.34	11.27	8.41	15.16
Ed Dain	-1.36	-1.57	-1.17	27.16	19.58	34.81	19.89	11.25	28.49	7.12	3.40	11.84
Assalaya	-1.78	-1.94	-1.64	41.70	36.09	47.53	28.39	20.13	35.33	13.61	8.62	18.64
El Firdous	-1.42	-1.54	-1.30	26.99	22.08	33.26	20.64	14.39	27.31	6.27	3.85	10.52
Shia-ria	-2.18	-2.35	-2.02	55.77	48.11	59.69	25.96	18.07	33.48	29.47	23.96	33.02
Yassin	-1.86	-2.17	-1.55	43.78	32.65	53.42	23.68	11.76	37.54	19.44	11.17	27.67
East Darfur State	-1.60	-1.80	-1.39	35.97	29.47	42.47	23.73	15.51	31.96	12.10	7.03	17.17
El Geneina	-1.39	-1.52	-1.27	26.13	21.29	30.42	19.70	14.12	24.67	6.11	4.00	9.40
Habila	-1.17	-1.36	-0.95	23.78	17.31	29.44	18.06	10.70	24.56	5.66	2.87	9.33
Kulbus	-1.56	-1.69	-1.41	35.32	28.30	40.31	25.56	17.95	31.49	9.84	5.89	13.35
Beida	-1.31	-1.42	-1.21	27.74	22.29	32.46	20.66	14.85	26.23	7.09	4.49	9.92
Foro Baranga	-0.95	-1.36	-0.60	17.62	8.85	28.88	13.26	1.50	25.75	4.10	1.07	11.71
Kereneik	-1.42	-1.54	-1.29	27.48	23.25	32.45	21.33	16.56	25.98	6.16	4.33	9.15
Sirba	-1.38	-1.54	-1.19	27.22	20.54	36.07	21.91	13.94	30.70	5.41	3.04	9.96
Jebel Moon	-1.27	-1.47	-1.05	24.93	18.59	33.98	19.08	12.19	28.06	5.59	2.79	9.98
West Darfur State	-1.34	-1.52	-1.16	26.71	19.72	33.70	20.12	12.39	27.85	6.32	2.86	9.79
Zalingi	-1.56	-1.72	-1.40	35.10	28.72	39.87	22.86	16.18	28.74	12.15	8.07	15.63
Wadi Salih	-1.46	-1.74	-1.26	35.55	28.89	43.84	21.86	13.77	30.75	13.62	9.48	19.40
Mukjar	-1.03	-1.19	-0.86	17.67	12.71	23.38	14.39	8.81	20.45	3.16	1.56	6.34
Central Jebel Mara	-1.78	-2.09	-1.46	41.68	30.59	51.88	28.93	14.99	41.70	12.97	4.73	21.63
North Jebel Mara	-2.01	-2.31	-1.73	46.92	31.49	57.30	29.78	13.69	43.70	16.40	7.74	25.77
Bendasi	-1.44	-1.57	-1.31	24.66	20.03	32.46	20.54	14.05	28.27	4.21	1.68	8.32
Nertiti	-1.73	-1.93	-1.52	38.56	29.72	47.23	24.27	13.40	34.49	13.99	8.20	21.12
Azum	-1.44	-1.58	-1.31	27.02	21.32	32.13	21.23	13.85	27.28	5.78	3.10	9.28

TABLE 4: Mean WAZ and underweight prevalence by locality and by state

Location	Mean WAZ %			WAZ < -2 %			WAZ between -3 and -2 %			WAZ < -3 %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Um Dukhun	-1.66	-2.03	-1.37	34.54	24.84	44.39	20.99	7.59	33.61	13.02	6.12	25.00
Central Darfur State	-1.56	-1.80	-1.32	33.64	26.40	40.89	22.57	12.62	32.52	10.84	4.85	16.82

Spatial distribution of underweight

Figures 19 to 26 show the spatial distribution of underweight prevalence.

FIGURE 19:
Child: Mean WAZ (raster)

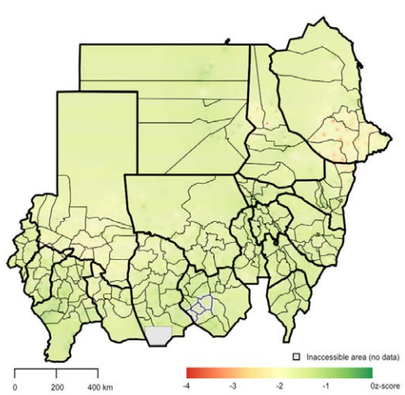


FIGURE 20:
Child: Mean WAZ

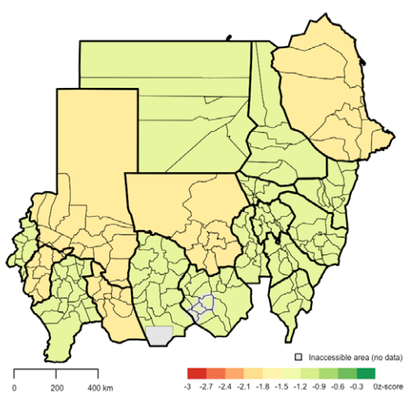


FIGURE 21:
Child: WAZ < -2 (raster)

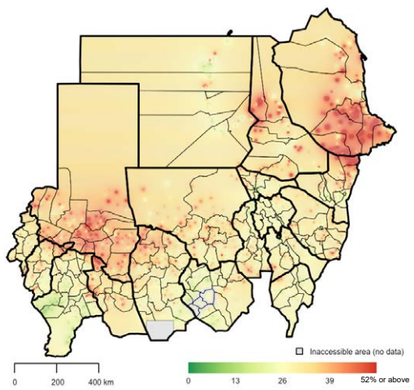


FIGURE 22:
Child: WAZ < -2

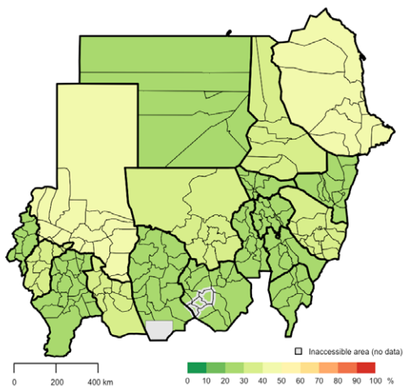


FIGURE 23:
Child: WAZ between -3 and -2 (raster)

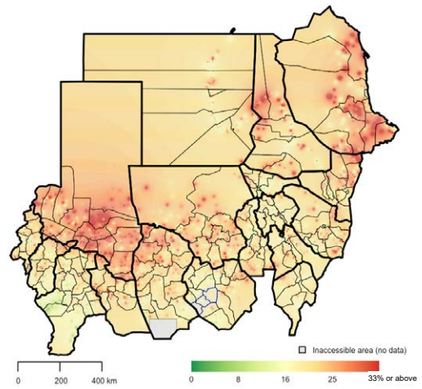


FIGURE 24:
Child: WAZ between -3 and -2

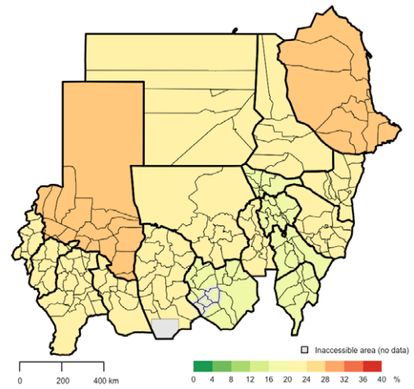


FIGURE 25:
Child: WAZ < - 3 (raster)

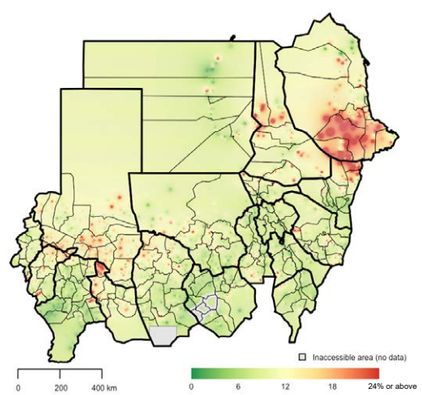
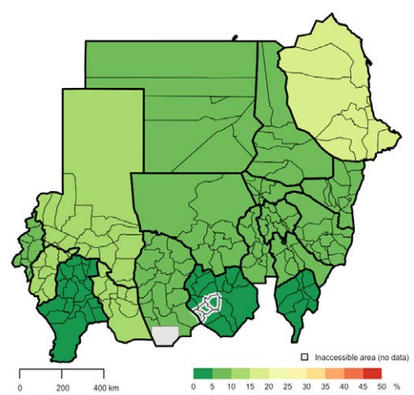


FIGURE 26:
Child: WAZ < - 3



3.1.3 Wasting by mid-upper-arm circumference (MUAC)

Wasting by MUAC average results

The **mean MUAC** of children 6-59 months old in Sudan was 141.44 (139.66 – 143.21) mm.

Among the states, the mean MUAC was highest in Khartoum state at 146.16 (95 per cent CI: 144.24-148.08) mm, while Red Sea state had the lowest mean MUAC at 132.2 (95 per cent CI: 129.99-134.42) mm *(see Figure 27)*.

Among the localities, Sennar locality in Sennar state had the highest mean MUAC at 148.17 (95 per cent CI: 146.58-149.61) mm. Seven localities from Red Sea state and Sharg El Jabal (accessible parts) from South Darfur state have the lowest mean MUAC of all localities *(see Figure 27)*.

Prevalence of wasting as measured by MUAC was 9.5 percent (95 per cent CI: 4.9-14.1 per cent) across Sudan.
Moderate wasting by MUAC was 7.63 per cent (95 per cent CI: 2.69-12.6 per cent).
Severe wasting by MUAC was 1.76 per cent (95 per cent CI: 0.01-3.62 per cent).

Of all the localities, 19.5 per cent had wasting by MUAC prevalence greater than the 15 per cent threshold, which is considered as very high. Among the states, Red Sea state had the highest prevalence of global, moderate and severe wasting by MUAC with a 29.6 per cent GAM rate, 21 per cent MAM rate and 8.5 per cent SAM rate. North Darfur state also had a relatively higher prevalence of global and moderate wasting by MUAC with a 15.9 per cent GAM rate, 12.4 per cent MAM rate and 3.2 per cent SAM rate. On the other hand, Khartoum state had the lowest prevalence of global and moderate wasting by MUAC with a 5.2 per cent GAM rate, 4.3 percent MAM rate and 0.83 per cent SAM rate. Northern state had the lowest prevalence of severe wasting by MUAC with a 0.69 per cent SAM rate *(see Figure 28).*

FIGURE 27: Box plot of state and locality results for mean MUAC

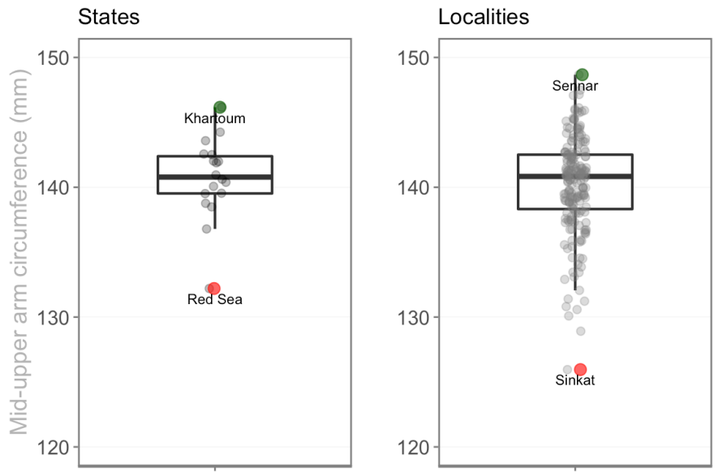
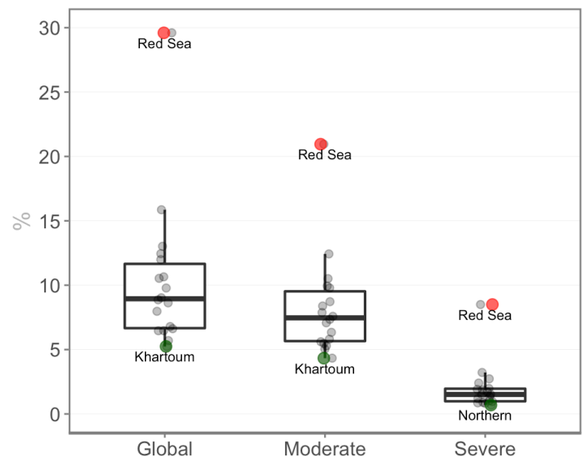


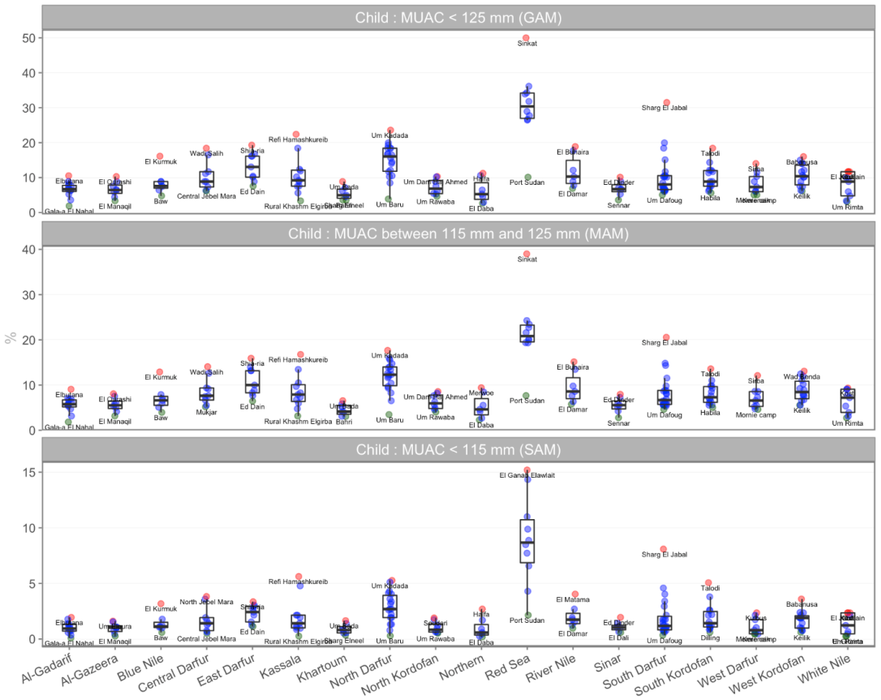
FIGURE 28: Box plot of state results of child wasting by MUAC



There was great inter-locality variability in Red Sea state, with outlier localities at the two extremes – some with extremely high wasting by MUAC and other localities with extremely low wasting by MUAC. South Darfur state also had outlier localities with a high prevalence of wasting by MUAC *(see Figure 29).*

Table 5 and Table 6 present results per locality, per state, and at the national level for mean MUAC and the prevalence of global, moderate and severe wasting by MUAC.

FIGURE 29: Box plot of locality results of child wasting by mid-upper-arm circumference (MUAC)



Wasting comparison between S3M I and S3M II using MUAC

Comparing S3M I with S3M II results showed that global wasting increased significantly in five states: River Nile (from 4.2 per cent in 2013 to 10.7 per cent); Red Sea (from 22 per cent in 2013 to 29.6 per cent); White Nile (from 6.8 per cent in 2013 to 7.97 per cent); Northern (from 1.9 per cent in 2013 to 5.7 per cent); and West Kordofan (from 7.8 per cent in 2013 to 12.0 per cent).

By contrast, wasting prevalence was significantly decreased in three states: Blue Nile (from 17.5 per cent in 2013 to 8.6 per cent); Kassala (from 16.5 per cent in 2013 to 12.5 per cent); and Al-Gadarif (from 12.4 per cent in 2013 to 6.6 per cent).

Severe wasting decreased in all other states, with particularly significant reductions in: Blue Nile (from 4.8 per cent in 2013 to 1.5 per cent); North Darfur (from 5.8 per cent in 2013 to 3.2 per cent); Kassala (from 4.3 per cent in 2013 to 2.7 per cent); and Al-Gazeera (from 2.6 per cent in 2013 to 0.9 per cent).

TABLE 5: Mean MUAC and wasting prevalence by MUAC by state and national

State	Mean MUAC (mm)			MUAC < 125 mm GAM %			MUAC between 115 mm and 125 mm MAM %			MUAC < 115 mm SAM %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	143.59	141.82	145.36	6.62	2.99	10.25	5.61	2.03	9.19	0.97	0.01	1.96
Al-Gazeera	142.56	140.85	144.28	6.46	2.40	10.52	5.48	1.30	9.67	0.86	0.01	1.79
Blue Nile	142.02	140.36	143.69	8.63	5.21	12.04	7.08	3.40	10.75	1.51	0.24	2.78
Central Darfur	139.52	137.69	141.35	10.53	5.99	15.08	8.72	3.90	13.53	1.72	0.13	3.31
East Darfur	138.49	136.74	140.24	13.02	7.26	18.79	10.51	4.10	16.92	2.40	0.26	4.55
Kassala	139.54	138.05	141.02	12.45	8.46	16.44	9.79	5.03	14.55	2.73	0.88	4.58
Khartoum	146.16	144.24	148.08	5.24	2.04	8.44	4.33	1.04	7.62	0.83	0.01	1.76
North Darfur	136.79	134.94	138.64	15.86	9.59	22.13	12.43	5.60	19.26	3.22	0.75	5.69
North Kordofan	141.88	140.37	143.40	6.79	3.29	10.29	5.81	1.99	9.63	0.89	0.01	1.98
Northern	142.51	140.79	144.23	5.70	1.57	9.84	5.04	0.69	9.40	0.69	0.01	1.54
Red Sea	132.20	129.99	134.42	29.60	21.84	37.36	20.95	11.81	30.09	8.50	3.27	13.72
River Nile	140.95	138.97	142.93	10.65	4.63	16.66	8.38	2.21	14.55	1.98	0.01	4.55
Sennar	144.24	142.54	145.94	6.47	2.85	10.09	5.29	1.68	8.89	1.03	0.01	2.16
South Darfur	140.62	138.96	142.27	8.87	4.75	13.00	7.35	2.91	11.80	1.52	0.01	3.42
South Kordofan	140.39	138.26	142.52	9.78	5.08	14.49	7.88	2.81	12.95	1.86	0.09	3.63
West Darfur	140.06	138.63	141.49	9.02	4.90	13.14	7.58	3.66	11.50	1.34	0.19	2.50
West Kordofan	138.76	137.01	140.51	11.99	6.42	17.57	9.94	4.09	15.78	1.91	0.14	3.67
White Nile	141.99	140.40	143.58	7.97	2.71	13.22	6.34	1.05	11.64	1.19	0.01	2.75
Sudan	141.44	139.66	143.21	9.50	4.90	14.09	7.63	2.69	12.56	1.76	0.01	3.62

TABLE 6: Mean MUAC and wasting prevalence by MUAC by locality and by state

Location	Mean MUAC (mm)			MUAC < 125 mm GAM %			MUAC between 115 mm and 125 mm MAM %			MUAC < 115 mm SAM %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	144.06	142.85	145.21	5.27	2.14	7.75	4.36	1.52	7.55	0.57	0.13	1.31
El Golid	143.21	141.54	144.87	6.46	4.14	8.87	5.54	3.00	8.42	0.91	0.35	1.98
Merwoe	137.31	135.49	139.35	10.65	5.26	18.04	9.38	2.93	16.56	1.70	0.40	3.83
El Daba	144.06	142.60	145.49	2.70	0.71	5.47	2.43	0.53	5.20	0.19	0.01	0.60
Halfa	142.15	140.54	143.95	6.32	1.90	10.30	5.56	0.93	9.54	0.76	0.10	1.75
Delgo	143.17	141.49	144.81	5.07	2.15	7.66	4.26	1.52	7.24	0.57	0.13	1.31

TABLE 6: Mean MUAC and wasting prevalence by MUAC by locality and by state

Location	Mean MUAC (mm)			MUAC < 125 mm GAM %			MUAC between 115 mm and 125 mm MAM %			MUAC < 115 mm SAM %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Burgaig	145.55	143.99	147.22	3.60	1.70	5.47	3.14	1.25	4.92	0.35	0.10	0.86
Northern State	142.51	140.79	144.23	5.70	1.57	9.84	5.04	0.69	9.40	0.69	0.01	1.54
El Matama	136.26	134.07	138.49	20.91	8.87	27.32	14.85	2.36	23.54	5.78	1.23	9.95
Shendi	140.96	138.89	143.22	10.30	5.46	17.05	8.55	2.84	15.30	1.75	0.59	4.96
Abu Hamad	139.96	138.26	141.64	8.87	2.15	15.58	7.64	0.92	14.36	1.23	0.04	4.59
Barbar	138.42	136.03	141.39	11.70	7.05	16.13	9.31	4.28	14.64	2.15	0.35	4.59
El Damar	142.93	141.74	143.99	6.95	5.27	11.70	5.73	3.95	10.10	0.97	0.59	2.36
Atbara	147.08	145.05	149.19	4.59	1.54	9.90	3.66	0.32	8.72	0.82	0.15	2.16
El Buhaira	132.51	130.87	134.10	20.52	13.05	29.47	16.77	7.52	25.88	3.60	1.23	7.59
River Nile State	140.95	138.97	142.93	10.65	4.63	16.66	8.38	2.21	14.55	1.98	0.01	4.55
Khartoum	147.36	145.66	149.32	4.04	1.54	7.78	3.41	0.67	6.69	0.67	0.11	1.66
Bahri	147.68	145.87	149.18	3.60	1.75	8.35	3.01	0.74	7.51	0.54	0.16	2.15
Um Durman	145.87	143.86	147.93	6.89	3.82	10.06	5.63	1.95	8.86	1.49	0.54	2.71
Um Bada	145.77	144.30	147.34	6.70	2.39	10.00	5.47	0.85	8.98	1.23	0.19	2.52
Jebel Awlia	144.86	142.79	146.71	5.63	2.15	9.51	4.84	1.08	8.78	0.86	0.11	2.15
Sharg Elneel	147.21	145.09	149.21	3.18	1.12	5.78	2.73	0.50	5.51	0.44	0.04	1.01
Karrari	144.68	142.57	146.64	5.46	2.70	7.72	4.40	1.63	7.28	0.86	0.26	1.66
Khartoum State	146.16	144.24	148.08	5.24	2.04	8.44	4.33	1.04	7.62	0.83	0.01	1.76
Greater Medani	142.99	141.48	144.59	6.32	3.36	11.70	5.44	1.94	10.99	0.76	0.19	3.05
Ganub Elgazira	144.54	142.82	146.21	6.70	3.60	8.87	5.47	2.53	8.30	1.23	0.57	1.79
El Hassahisa	142.02	140.30	144.13	5.46	2.70	13.05	4.82	1.33	12.59	0.59	0.19	3.05
El Kamlin	142.68	141.09	144.17	6.46	3.59	11.37	5.54	2.34	10.06	0.91	0.26	2.58
Sharg El Gezira	142.62	140.21	145.00	7.51	2.70	11.70	6.19	1.93	10.77	0.97	0.25	2.57
Um Elqura	140.59	139.17	142.11	8.87	4.14	13.67	7.26	2.62	12.59	1.42	0.35	3.60
El Manaqil	143.47	142.18	144.83	4.14	2.43	7.59	3.79	1.83	7.07	0.35	0.13	1.14
El Qurashi	139.48	137.23	141.33	10.13	4.59	14.34	7.96	3.00	13.83	1.35	0.25	3.18
Al-Gazeera State	142.56	140.85	144.28	6.46	2.40	10.52	5.48	1.30	9.67	0.86	0.01	1.79
Sennar	148.17	146.58	149.61	3.60	1.75	7.06	2.89	0.84	6.63	0.54	0.16	1.66
Sharg Sennar	141.53	139.65	143.11	7.66	4.38	13.08	6.60	2.50	11.99	1.42	0.46	3.26
Sinja	145.86	144.47	147.30	6.58	2.95	8.87	5.05	1.83	8.02	1.07	0.27	1.97
Abu Hujar	142.58	140.58	144.45	5.27	1.90	11.52	4.68	1.08	10.07	0.59	0.09	2.15
El Dali	142.63	140.75	144.60	6.46	3.82	10.21	5.23	2.73	9.62	0.91	0.46	2.57
Es Suki	144.91	143.36	146.69	6.46	3.36	10.00	5.21	2.17	8.41	1.07	0.35	2.15
Ed Dinder	140.95	138.75	143.52	10.21	5.27	13.05	8.15	3.32	11.99	1.75	0.76	3.60
Sennar State	144.24	142.54	145.94	6.47	2.85	10.09	5.29	1.68	8.89	1.03	0.01	2.16
Ed Damazine	143.83	142.46	145.10	7.59	4.59	10.06	5.98	3.12	8.77	1.17	0.57	2.15

TABLE 6: Mean MUAC and wasting prevalence by MUAC by locality and by state

Location	Mean MUAC (mm)			MUAC < 125 mm GAM %			MUAC between 115 mm and 125 mm MAM %			MUAC < 115 mm SAM %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Tadamon	141.83	140.28	143.44	7.59	5.07	11.52	6.62	3.65	10.24	1.14	0.35	2.16
El Roseiris	142.59	141.18	143.84	8.87	6.58	12.58	7.07	4.42	10.64	1.79	1.03	2.90
Baw	144.47	143.02	145.91	4.78	2.39	7.21	4.03	1.69	6.50	0.69	0.20	1.23
Geisan	143.96	141.73	146.23	6.58	2.95	10.06	5.34	1.39	8.90	1.07	0.27	2.32
El Kurmuk	136.78	134.70	139.98	16.76	10.30	23.76	13.08	6.37	20.81	3.38	1.22	6.58
Wad El Mahi	138.67	137.54	139.73	8.87	7.19	12.12	7.96	5.77	11.08	1.23	0.61	2.15
Blue Nile State	142.02	140.36	143.69	8.63	5.21	12.04	7.08	3.40	10.75	1.51	0.24	2.78
Kosti	139.71	138.25	141.23	11.70	7.78	15.14	9.07	5.07	13.22	2.36	1.22	3.80
Guli	139.02	137.82	140.27	10.30	5.98	15.58	7.87	4.28	14.36	1.75	0.80	4.59
Tendalti	146.81	144.55	148.99	3.60	1.54	8.87	3.09	0.51	8.42	0.54	0.11	2.15
Es Salam	139.27	137.86	140.60	5.98	2.15	10.40	5.73	0.92	10.16	0.47	0.04	2.06
Rabak	143.13	141.50	144.60	10.13	4.59	15.58	7.64	2.13	13.85	1.95	0.59	4.59
El Jabalain	140.02	138.60	141.36	10.30	5.98	13.05	8.39	3.62	12.25	1.75	0.47	3.61
El Diwaim	141.30	139.90	142.71	7.42	2.15	11.70	6.19	0.92	11.45	0.62	0.04	2.36
Um Rimta	146.04	143.72	148.03	3.60	1.09	7.66	3.14	0.41	7.39	0.26	0.01	1.31
El Gitaina	145.27	143.53	146.99	3.60	1.23	6.58	3.32	0.66	6.45	0.35	0.04	1.07
White Nile State	141.99	140.40	143.58	7.97	2.71	13.22	6.34	1.05	11.64	1.19	0.01	2.75
Port Sudan	140.51	138.81	142.38	11.37	7.66	16.33	8.82	4.23	13.77	2.76	1.31	4.74
Swakin	132.85	131.24	134.27	25.00	18.42	33.67	18.27	11.07	27.03	6.46	3.60	10.30
El Gonob Welawlaib	132.05	129.53	134.31	29.99	23.41	36.80	19.29	10.13	27.85	10.13	6.32	15.94
Sinkat	126.11	124.50	128.01	50.00	41.75	56.02	39.00	28.42	46.52	11.24	6.89	16.14
Haya	130.12	128.03	132.27	33.90	25.98	42.36	24.63	14.28	34.32	8.87	3.60	16.13
Dordieb	130.92	128.49	133.90	32.65	26.97	40.51	24.21	16.05	31.36	7.78	4.59	12.26
Tokar	128.66	126.78	130.29	36.80	32.65	45.12	21.82	14.33	30.79	14.97	9.57	22.04
Agig	133.80	131.82	135.80	27.44	18.42	31.70	18.89	9.43	25.69	7.59	3.32	11.38
Gabaot Elma-aadin	131.28	129.04	133.48	28.36	20.91	36.16	19.59	10.71	29.62	8.87	4.14	13.36
Halaeeb (accessible parts)	131.26	127.98	136.20	27.44	17.46	41.11	19.73	4.06	35.23	7.51	2.30	17.91
Red Sea State	132.20	129.99	134.42	29.60	21.84	37.36	20.95	11.81	30.09	8.50	3.27	13.72
Kassala Town	140.68	138.78	142.33	10.21	6.46	15.58	8.26	4.06	13.30	2.15	0.90	4.76
Refi Kassla	139.59	138.46	140.57	11.52	7.51	15.60	9.17	5.37	13.89	1.93	0.97	3.81
Rural Western Kassala	141.73	140.62	142.87	7.59	5.04	10.13	6.45	3.06	9.37	1.14	0.26	2.15
New Halfa	145.36	143.56	146.94	6.58	3.60	8.87	5.27	2.21	8.14	1.07	0.56	2.15
Refi Nahr Atbara	140.26	138.77	141.83	10.13	6.16	13.33	8.07	3.11	12.29	1.75	0.46	3.80

TABLE 6: Mean MUAC and wasting prevalence by MUAC by locality and by state

Location	Mean MUAC (mm)			MUAC < 125 mm GAM %			MUAC between 115 mm and 125 mm MAM %			MUAC < 115 mm SAM %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Khashm Elgirba	143.82	142.52	144.88	3.36	1.36	5.46	3.16	0.91	5.20	0.27	0.03	0.72
Rural Wad Elhilaiw	138.86	137.41	140.39	10.40	7.31	14.72	8.97	5.27	13.02	1.54	0.64	2.84
Rural Aroma	138.10	136.54	139.45	14.46	10.32	19.96	11.75	6.49	17.34	2.62	0.91	4.78
Refi North Delta	140.19	138.42	142.29	7.59	4.84	12.40	6.82	3.17	11.60	0.97	0.35	2.15
Refi Hamashkureib	133.71	132.45	135.06	23.76	18.42	27.77	17.17	11.07	22.70	6.46	3.60	8.87
Rural Telkok	136.70	135.12	138.11	18.42	12.12	23.09	13.46	7.47	18.48	4.96	2.62	7.95
Kassala State	139.54	138.05	141.02	12.45	8.46	16.44	9.79	5.03	14.55	2.73	0.88	4.58
Gedaref Town	143.93	141.85	145.92	5.07	2.70	8.87	4.48	1.97	7.96	0.59	0.12	1.31
Middle Geddaref	141.51	139.65	143.42	7.59	5.07	10.53	6.62	3.69	9.69	1.14	0.46	2.15
Elbutana	139.54	137.25	141.69	10.30	6.16	16.51	8.65	3.31	14.65	1.70	0.47	3.80
El Fashaga	142.67	141.29	144.13	6.32	3.09	10.21	5.56	2.04	9.49	0.80	0.19	1.95
El Rahad	144.76	143.26	146.39	8.87	5.63	11.37	7.07	3.46	9.92	1.90	1.00	2.95
Gala-a El Nahal	144.53	142.47	146.31	4.34	0.99	8.87	3.51	0.19	8.41	0.35	0.02	1.55
El Fao	145.10	143.18	146.99	6.22	2.94	10.06	5.08	1.56	9.31	1.01	0.27	2.35
El Qureisha	145.54	144.13	147.10	4.96	1.92	8.87	4.23	0.92	7.58	0.82	0.11	2.15
El Mafaza	141.56	140.38	142.91	7.59	5.07	11.70	6.66	3.46	10.76	1.14	0.46	2.57
Basunda	146.16	143.81	148.50	3.60	1.03	7.72	3.25	0.47	7.47	0.35	0.05	1.31
Western Galabat	141.02	139.63	142.55	7.51	3.89	12.12	6.88	3.09	11.37	0.97	0.35	2.57
Eastern Galabat	143.77	142.42	145.37	7.59	4.14	10.13	6.11	3.00	9.29	1.07	0.35	2.15
Al-Gadarif State	143.59	141.82	145.36	6.62	2.99	10.25	5.61	2.03	9.19	0.97	0.01	1.96
Sheikan	143.38	142.40	144.30	4.38	3.36	6.32	4.03	2.78	5.73	0.46	0.26	0.92
Um Rawaba	142.60	141.09	144.00	5.27	3.60	11.53	4.68	2.00	10.89	0.59	0.35	2.57
Um Dam Haj Ahmed	139.82	137.90	141.81	10.30	5.06	14.34	8.58	2.71	13.28	1.75	0.59	3.80
El Rahad	141.24	139.49	142.72	5.98	2.49	8.89	5.09	1.94	8.61	0.59	0.07	1.95
Bara	141.88	140.19	143.81	8.87	5.27	13.05	7.24	3.32	11.66	1.42	0.51	3.05
Gharb Bara	141.13	139.17	143.11	7.42	3.89	10.45	6.28	3.09	9.84	0.80	0.25	1.95
Soudari	140.77	139.58	142.19	8.87	4.59	13.05	7.64	2.53	11.84	1.23	0.25	3.05
Gebrat El Sheikh	140.66	139.01	142.45	8.87	5.27	13.05	7.45	3.52	11.93	1.33	0.46	3.05
North Kordofan State	141.88	140.37	143.40	6.79	3.29	10.29	5.81	1.99	9.63	0.89	0.01	1.98
Kadugli	144.16	142.91	145.33	6.46	3.60	7.72	5.39	2.53	7.15	0.91	0.35	1.49
Reif Shargi	139.50	138.41	140.74	14.34	10.30	16.90	10.68	5.81	13.83	3.80	1.75	4.59
Dilling	140.49	137.36	144.23	5.27	0.98	10.52	4.81	0.19	9.66	0.35	0.02	1.54

TABLE 6: Mean MUAC and wasting prevalence by MUAC by locality and by state

Location	Mean MUAC (mm)			MUAC < 125 mm GAM %			MUAC between 115 mm and 125 mm MAM %			MUAC < 115 mm SAM %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Quoz	140.65	138.67	142.07	7.51	3.60	11.92	6.28	2.28	11.59	0.80	0.17	2.57
Habila	141.65	140.06	143.26	8.87	5.63	11.52	6.91	4.16	10.41	1.42	0.61	2.61
Abassiya	141.54	139.53	142.96	7.59	3.86	11.89	6.45	2.41	11.23	1.14	0.26	2.57
El Rashad	140.00	138.47	141.72	8.87	5.07	11.89	7.45	3.53	10.58	1.23	0.46	2.36
Abu Jubaiha	137.09	135.14	139.40	16.13	10.30	21.71	12.64	6.30	18.79	3.40	1.54	5.78
El Tadamon	140.52	138.92	142.32	10.40	7.51	14.70	8.67	4.20	13.48	2.15	0.80	4.42
Talodi	138.05	134.76	142.66	17.80	7.58	26.45	12.73	1.76	22.80	5.01	0.96	9.89
Ghadeer	139.17	137.25	141.19	12.38	6.63	17.25	10.35	4.10	15.45	1.93	0.60	4.42
El Leri	140.78	138.98	142.84	11.52	6.46	15.58	8.96	3.41	13.63	2.57	0.91	4.59
Abu Karshola	142.27	140.49	143.91	7.66	5.37	11.71	6.45	3.74	10.62	1.31	0.59	2.76
Delami	141.16	138.71	143.44	8.14	3.29	13.66	6.75	1.64	12.75	1.23	0.17	3.05
South Kordofan State	141.12	140.53	141.67	10.21	7.59	11.70	8.26	5.63	9.74	1.95	1.14	2.57
Abu Zabad	140.79	138.25	143.11	11.52	4.80	15.58	9.00	2.66	13.88	2.15	0.46	3.97
ElKhiwai	140.83	139.49	142.15	7.51	4.13	11.70	6.47	2.83	10.74	1.14	0.25	2.36
Ghubaish	136.85	135.53	138.21	14.03	10.52	18.42	12.13	8.29	16.96	2.15	0.71	3.60
El Nuhud	136.56	134.99	138.06	16.13	10.40	19.96	12.97	6.80	17.40	2.70	1.23	4.59
El Idia	139.98	137.92	142.25	8.87	3.60	13.65	7.11	2.69	12.81	0.97	0.17	2.95
Wad Benda	135.16	133.64	136.68	14.97	11.00	19.29	13.07	9.11	17.55	1.90	0.71	3.85
Lagawa	138.39	136.77	139.85	12.38	7.31	18.42	10.63	4.09	16.75	1.93	0.61	4.78
Elsunut	138.73	137.14	140.39	8.87	4.59	16.13	8.07	3.02	14.92	1.23	0.35	3.18
Keilik	140.85	139.87	141.88	6.16	3.89	10.30	5.80	3.09	9.53	0.61	0.17	1.75
Es Salam	142.62	141.27	143.93	6.32	3.59	9.89	5.31	2.63	9.00	0.76	0.26	1.95
Babanusa	138.23	136.84	139.72	14.70	10.40	21.37	11.42	6.06	18.21	3.40	1.75	6.05
Abyei	142.45	140.37	144.20	8.87	6.16	14.34	7.45	3.57	12.39	1.79	0.65	3.80
El Dibab	139.69	136.97	142.07	12.38	5.98	19.03	9.77	2.18	16.47	2.36	0.47	5.82
El Meiram	141.69	139.75	143.50	11.00	6.28	17.88	8.29	2.10	15.74	2.36	0.76	7.13
West Kordofan State	138.76	137.01	140.51	11.99	6.42	17.57	9.94	4.09	15.78	1.91	0.14	3.67
El Fasher	137.33	136.17	138.31	15.58	10.52	20.49	12.27	7.22	17.80	3.18	1.54	5.78
Tawila	139.23	137.48	140.85	10.40	6.16	16.13	8.71	4.24	14.38	1.75	0.61	3.40
Melit	134.47	132.99	136.00	20.49	14.46	26.28	15.96	9.87	21.91	4.38	2.15	7.13
Um Kadada	133.47	131.91	134.74	23.59	16.76	32.65	17.81	11.30	26.17	5.27	2.43	7.59
Kebkabiya	138.09	136.12	139.95	17.80	11.87	24.08	12.75	6.52	19.92	5.12	1.93	8.87
Kutum	139.07	137.95	140.20	8.87	4.84	12.91	7.94	3.46	11.50	1.33	0.35	2.62
El Mahalha	134.44	132.87	135.87	19.29	13.46	25.00	15.93	9.03	21.71	3.36	1.23	5.46

TABLE 6: Mean MUAC and wasting prevalence by MUAC by locality and by state

Location	Mean MUAC (mm)			MUAC < 125 mm GAM %			MUAC between 115 mm and 125 mm MAM %			MUAC < 115 mm SAM %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Saraf Omra	135.70	134.58	136.90	18.42	14.03	23.76	13.85	8.77	19.08	4.06	2.15	6.80
El Serief	136.35	134.86	137.85	18.42	11.84	22.41	14.59	7.33	19.44	3.60	1.33	6.70
Dar Elsalam	136.76	135.54	138.26	12.68	8.87	19.15	10.78	5.61	17.31	2.15	0.95	3.83
Kelemando	136.03	134.53	137.32	15.31	10.81	19.31	13.07	8.26	17.20	2.70	0.91	4.59
El Tawisha	134.28	132.73	135.75	16.76	9.33	25.00	13.84	6.17	23.09	2.70	0.50	6.46
Um Baru	139.92	138.27	142.48	5.98	0.99	11.71	5.37	0.29	10.86	0.47	0.01	1.93
El Lait	137.71	136.21	139.00	14.03	8.87	21.74	11.07	4.54	19.36	2.66	1.12	6.80
ELkuma	135.69	132.27	137.78	18.42	11.00	27.17	14.57	7.15	23.90	3.60	0.42	7.72
El Tina	139.50	133.70	145.23	8.47	0.00	29.47	6.26	-3.62	28.35	0.84	0.00	10.77
Kernoi	136.39	135.37	137.40	17.69	12.67	21.37	13.73	8.77	18.43	3.60	1.90	5.78
North Darfur State	136.79	134.94	138.64	15.86	9.59	22.13	12.43	5.60	19.26	3.22	0.75	5.69
Nyala South	142.32	140.94	143.48	6.32	3.09	10.14	5.01	2.18	9.55	0.76	0.18	2.16
Nyala North	142.31	139.63	144.84	6.32	2.38	12.84	5.28	1.12	12.21	0.86	0.13	2.77
Es Salam	141.82	140.49	143.28	6.32	3.89	8.93	5.40	2.74	8.63	0.76	0.25	1.95
El Wihda	141.21	139.77	142.46	8.55	5.27	13.17	6.68	3.05	12.24	1.14	0.59	3.80
Mershing	140.95	139.51	142.38	6.34	3.89	10.30	5.73	3.14	9.60	0.76	0.30	1.75
Beliel	140.38	139.36	141.39	10.30	7.51	13.33	8.86	5.55	11.82	1.75	0.80	3.05
Nitega	138.39	136.34	140.34	10.65	7.13	18.42	9.11	3.81	17.32	1.47	0.47	4.15
Sharg El Jabal (accessible parts)	131.94	126.60	138.22	31.80	1.77	50.00	21.48	-9.23	43.20	7.42	0.00	24.20
Kas	138.04	136.94	139.24	15.58	11.88	19.96	11.83	7.47	16.50	3.60	2.14	5.27
Shattaya	135.84	134.64	136.85	18.42	14.03	22.41	14.70	10.01	19.51	3.60	1.90	5.63
Buram	140.12	138.37	141.90	7.42	3.60	10.52	6.19	2.75	10.04	0.80	0.17	1.75
Gereida	142.20	140.78	143.42	10.13	7.59	12.80	8.28	4.90	11.07	2.15	1.14	3.24
El Sunta	136.55	134.96	138.12	19.14	12.37	23.76	14.12	6.68	19.50	4.59	1.47	7.78
El Radoum	140.61	139.17	142.07	7.51	3.89	11.70	6.81	3.13	10.94	0.97	0.30	1.96
Tulus	140.99	137.39	142.56	7.59	5.07	13.35	6.35	3.41	12.19	1.14	0.34	3.05
Damso	140.88	138.75	143.01	11.70	7.58	16.76	9.33	4.12	14.40	2.87	1.14	5.41
Ed Elfursan	140.92	139.98	141.87	6.32	3.89	8.87	5.70	2.74	8.40	0.76	0.25	1.42
Kubum	143.54	142.08	144.82	6.58	4.59	10.06	5.73	2.79	9.15	1.07	0.57	2.34
Kateila	139.33	138.10	140.49	10.30	5.07	13.65	8.55	3.52	12.23	1.54	0.46	2.62
Rehaid Elbirdi	140.33	138.96	141.80	5.98	3.97	8.87	5.63	3.17	8.62	0.47	0.20	1.23
Um Dafoug	141.01	139.71	142.35	5.07	2.49	8.87	4.60	2.01	8.41	0.46	0.07	1.14
South Darfur State	140.62	138.96	142.27	8.87	4.75	13.00	7.35	2.91	11.80	1.52	0.01	3.42

TABLE 6: Mean MUAC and wasting prevalence by MUAC by locality and by state

Location	Mean MUAC (mm)			MUAC < 125 mm GAM %			MUAC between 115 mm and 125 mm MAM %			MUAC < 115 mm SAM %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Jabra	138.81	137.39	140.21	8.87	5.98	15.58	7.64	4.27	14.37	1.23	0.47	4.59
Abu Karinka	138.77	136.33	140.69	15.58	10.13	27.46	11.00	0.99	21.66	4.59	2.15	12.04
Bahr El Arab	138.94	137.40	140.38	10.40	5.98	16.13	8.75	4.04	14.98	1.54	0.47	3.60
Adila	136.13	134.03	138.00	16.13	10.52	19.96	13.16	7.05	17.34	2.70	1.12	4.59
Ed Dain	141.05	139.83	142.23	8.87	4.59	13.05	7.68	3.12	11.44	1.61	0.47	3.05
Assalaya	141.22	139.87	142.56	13.05	8.87	15.58	9.96	5.05	12.93	3.05	1.42	4.59
El Firdous	136.98	134.82	138.80	15.58	8.87	21.30	13.06	5.26	18.73	2.49	1.23	4.86
Shia-ria	136.47	135.07	137.84	13.05	8.87	21.57	11.82	4.71	20.57	1.23	0.35	4.59
Yassin	134.90	133.87	136.20	14.46	5.98	25.00	12.57	3.48	22.22	1.63	0.23	5.07
East Darfur State	138.49	136.74	140.24	13.02	7.26	18.79	10.51	4.10	16.92	2.40	0.26	4.55
El Geneina	140.18	138.90	141.39	10.30	7.42	13.05	8.46	5.22	11.82	1.75	0.80	3.05
Habila	139.30	137.57	140.91	7.42	4.29	12.12	6.62	3.14	10.91	0.80	0.30	2.15
Kulbus	141.37	139.55	142.89	10.40	7.50	16.50	8.60	4.09	14.75	2.15	0.97	4.21
Beida	138.55	137.49	139.62	5.98	3.29	8.87	5.51	2.82	8.24	0.47	0.11	0.85
Foro Baranga	139.00	137.20	140.54	8.87	5.76	16.13	7.83	3.25	15.10	1.04	0.35	3.60
Kereneik	140.40	139.44	141.55	6.32	4.32	8.87	5.86	3.42	8.26	0.61	0.35	1.42
Sirba	138.55	136.92	140.06	11.70	7.42	16.13	9.91	5.72	14.61	1.70	0.47	2.95
Jebel Moon	141.23	139.67	142.76	7.51	4.36	11.70	6.16	2.71	10.23	1.04	0.34	2.36
West Darfur State	140.06	138.63	141.49	9.02	4.90	13.14	7.58	3.66	11.50	1.34	0.19	2.50
Zalingi	140.03	138.15	141.60	10.30	7.50	13.33	8.48	5.23	11.58	1.75	0.97	3.05
Wadi Salih	136.56	134.42	138.46	18.42	12.11	21.37	14.55	8.50	18.77	3.60	1.90	5.78
Mukjar	142.25	140.57	143.79	6.32	2.80	8.90	5.35	1.66	8.68	0.76	0.08	1.61
Central Jebel Mara	140.06	138.11	141.74	6.16	2.80	14.05	5.51	1.78	13.29	0.53	0.10	2.64
North Jebel Mara	137.95	135.77	140.50	14.70	8.87	21.37	11.34	4.79	17.98	3.60	1.14	6.89
Bendasi	139.21	137.55	141.64	7.31	2.12	12.68	6.68	1.07	12.55	0.55	0.04	1.70
Nertiti	140.46	139.02	142.04	8.87	4.59	11.70	7.03	3.41	11.09	1.14	0.35	2.57
Azum	139.41	138.02	140.80	10.40	5.78	16.13	8.68	3.41	15.34	1.70	0.35	3.83
Um Dukhun	140.62	138.96	142.21	8.87	5.97	12.12	7.64	4.39	11.14	1.42	0.61	2.36
Central Darfur State	139.52	137.69	141.35	10.53	5.99	15.08	8.72	3.90	13.53	1.72	0.13	3.31

Spatial distribution of wasting (by MUAC)

Figures 30 to 37 show the spatial distribution of wasting by MUAC.

FIGURE 30:
Child: Mean MUAC (mm) (raster)

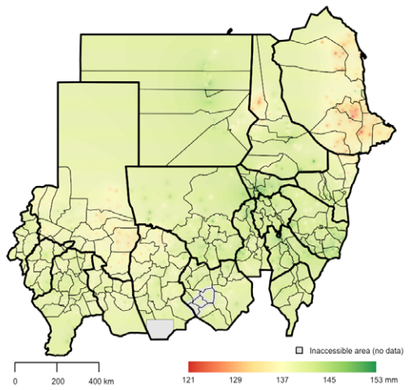


FIGURE 31:
Child: Mean MUAC (mm)

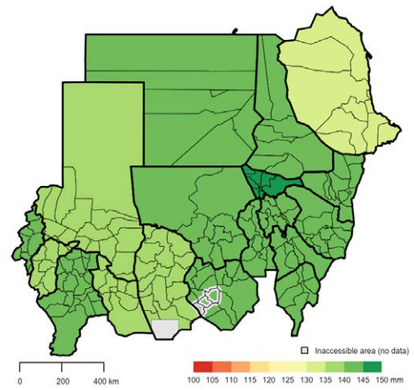


FIGURE 32:
Child: MUAC < 125 mm (GAM) (raster)

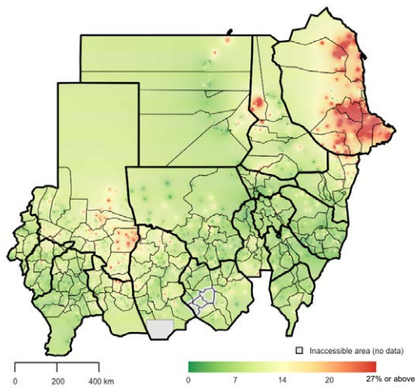


FIGURE 33:
Child: MUAC < 125 mm (GAM)

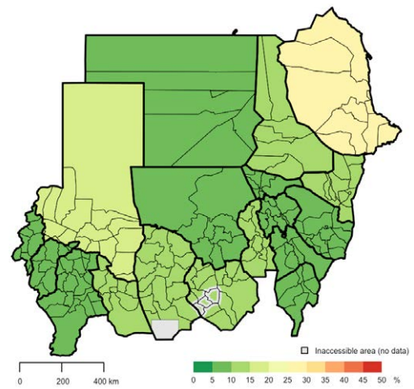


FIGURE 34:
Child: MUAC between 115 mm and 125 mm (MAM) (raster)

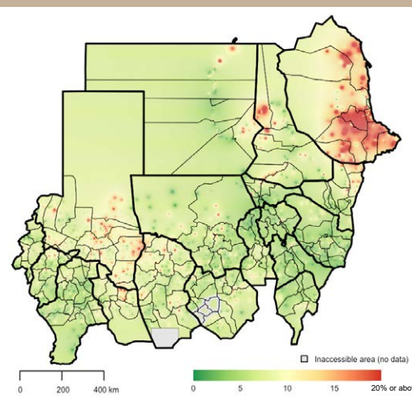


FIGURE 35:
Child: MUAC between 115 mm and 125 mm (MAM)

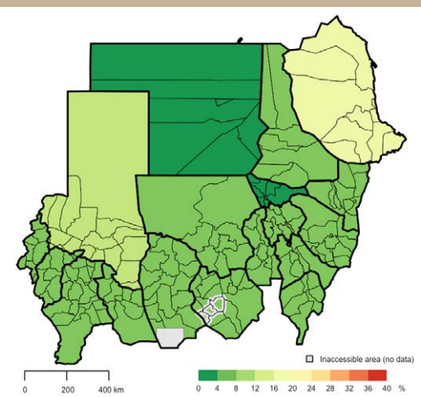


FIGURE 36:
Child: MUAC < 115 mm (SAM) (raster)

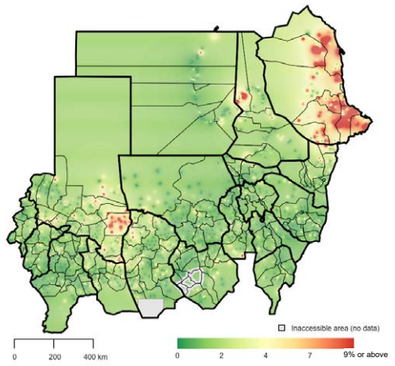
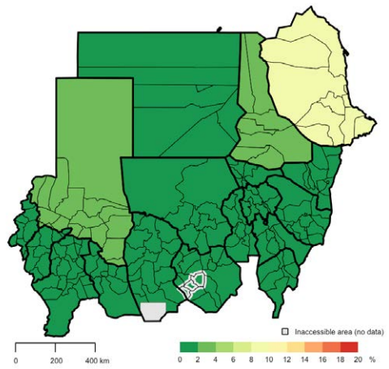


FIGURE 37:
Child: MUAC < 115 mm (SAM)



3.1.4 Wasting by weight-for-height Z-score (WHZ)

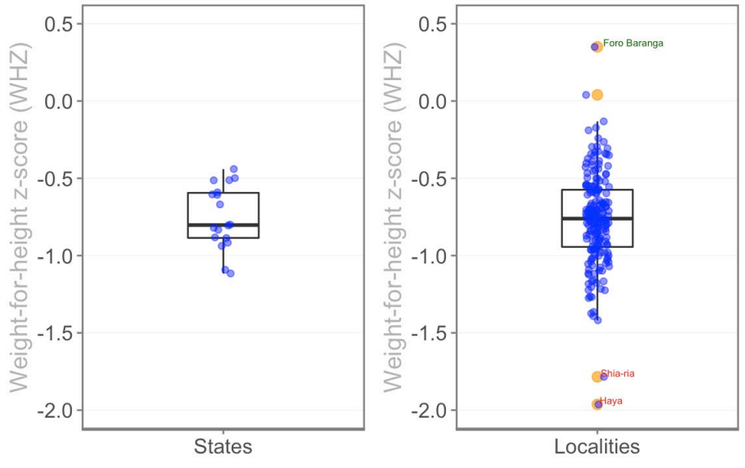
Wasting (by WHZ) average results

The mean weight-for-height Z-score (WHZ) of children 6-59 months old in Sudan was -0.76 (95 per cent CI: -0.96 –-0.57).

Among the states, the mean WHZ was highest in Blue Nile state at -0.44 (95 per cent CI: -0.61 –-0.27) Z-score, while Red Sea state had the lowest mean WHZ at -1.12 (95 per cent CI: -1.4 –-0.83) *(see Figure 38)*.

Among the localities, El Rahad locality in Al-Gadarif state and Foro Baranga locality in West Darfur state had the highest mean WHZ at 0.1 (95 per cent CI: -0.16 – 0.35). Shia-ria locality in East Darfur state and Haya locality in Red Sea state had a significantly lower mean WHZ than all other localities *(see Figure 38)*.

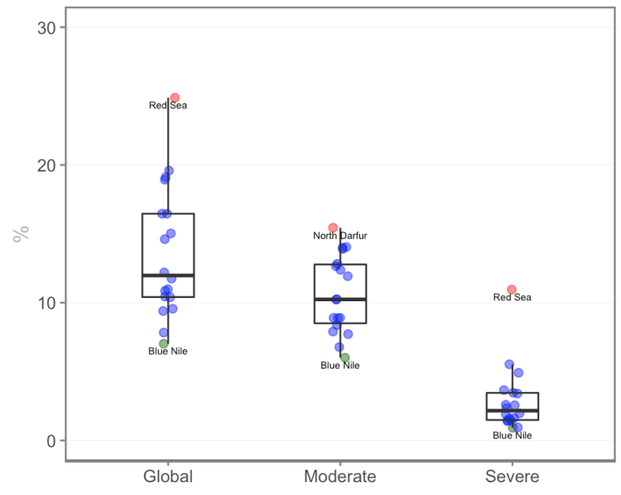
FIGURE 38: Box plot of state and locality results for mean weight-for-height Z-score (WHZ)



Global wasting by WHZ prevalence was 13.6 per cent (95 per cent CI: 8.2-19.0 per cent).. **Moderate wasting by WHZ prevalence** was 10.8 per cent (95 per cent CI: 4.7-16.9 per cent). **Severe wasting by WHZ prevalence** was 2.7 per cent (95 per cent CI: 0.01-5.6 per cent). These values were higher than the wasting prevalence by MUAC (which showed wasting of 9.5 per cent, moderate wasting of 7.6 per cent and severe wasting of 1.8 per cent). There was no single state in Sudan with wasting prevalence less than the WHO medium wasting threshold of 5 per cent .[38]

Among the states, Red Sea state had the highest prevalence of global and severe wasting by WHZ, while North Darfur had the highest prevalence of moderate wasting by WHZ. On the other hand, Blue Nile state had the lowest prevalence of global, moderate and severe wasting by WHZ *(see Figure 39)*.

FIGURE 39: Box plot of state results of child wasting by weight-for-height Z-score (WHZ)



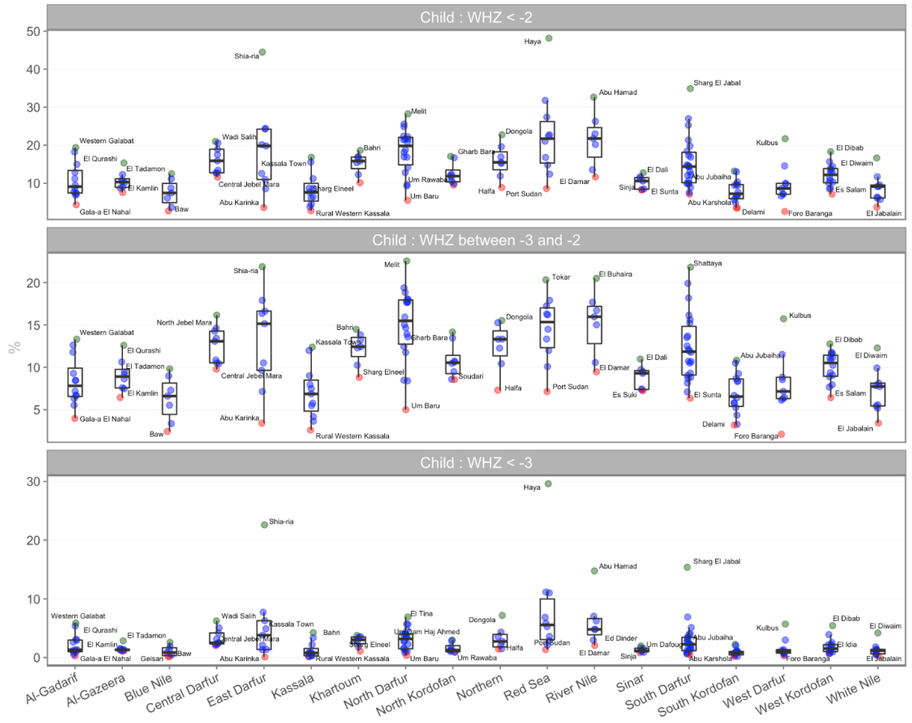
There was great inter-locality variability within East Darfur and Red Sea states, with outlier localities with extremely high prevalence of wasting by WHZ *(see Figure 39)*. Of all the localities, 34 per cent had global wasting prevalence greater than the 15 per cent threshold considered to be very high.

Table 7 and Table 8 present results of per locality, per state and national at the national level for mean WHZ and for prevalence of global, moderate and severe wasting by WHZ.

The survey showed that levels of wasting (low weight for height WHZ and MUAC) were relatively higher and more pronounced in those states where data was collected during phase one of data collection (North Darfur, East Darfur, West Kordofan, River Nile, Sennar, South Darfur, North Kordofan, Khartoum and Northern states), than those in phase two (White Nile, Kassala, Blue Nile, Central Darfur and West Darfur, Red Sea, South Kordofan and Gedaref states). This is likely due to the seasonal gap of time between the data collection periods, as the first phase overlapped more with the lean season in Sudan.

[38] As per WHO wasting threshold: prevalence equal to or greater than 15 per cent is considered very high; between 10 per cent and 15 per cent is considered high; from 5 per cent to 10 per cent is considered medium; and less than 5 per cent is considered low.

FIGURE 40: Box plot of locality results of children wasting by weight-for-height Z-score (WHZ)



Wasting (by WHZ) comparison between S3M I and S3M II

Comparing S3M I with S3M II results showed that global wasting by WHZ increased significantly in two states: Northern (from 7.3 per cent in 2013 to 16.5 per cent); and Khartoum (from 8.2 per cent in 2013 to 14.6 per cent).

The global wasting prevalence by WHZ significantly decreased in three states: Blue Nile (from 18.5 per cent in 2013 to 7.0 per cent); Kassala (from 15.2 per cent in 2013 to 9.4 per cent); and North Darfur (from 28.3 per cent in 2013 to 19.1 per cent). Global wasting by WHZ also decreased in the rest of the states, though not as significantly, and it remained roughly at the same level in Al-Gazeera state (9.6 per cent in 2013 and 10.4 per cent in 2018).

Similar to global wasting, severe wasting prevalence decreased in all except for the same two states: Northern (from 2.2 per cent in 2013 to 3.5 per cent); and Khartoum (from 1.8 per cent in 2013 to 2.6 per cent). Severe wasting decreased in all other states, with a particularly significant reduction in Blue Nile (from 7.7 per cent in 2013 to 0.92 per cent) and in North Darfur (from 7.8 per cent in 2013 to 3.4 per cent).

TABLE 7: Mean weight-for-height Z-score (WHZ) and wasting by WHZ by state and national

State	Mean WHZ %			WHZ < -2 %			WHZ between -3 and -2 %			WHZ < -3		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	-0.50	-0.72	-0.28	10.98	5.33	16.62	8.38	2.12	14.64	2.35	0.01	5.04
Al-Gazeera	-0.61	-0.77	-0.44	10.44	6.18	14.70	8.90	4.46	13.35	1.45	0.10	2.80
Blue Nile	-0.44	-0.61	-0.27	7.02	3.25	10.79	6.01	2.10	9.92	0.92	0.01	2.12
Central Darfur	-0.82	-1.04	-0.60	16.46	9.03	23.89	12.65	4.64	20.66	3.65	0.16	7.14
East Darfur	-0.94	-1.12	-0.75	18.93	13.18	24.68	13.90	7.18	20.63	4.91	1.87	7.95
Kassala	-0.60	-0.76	-0.45	9.40	4.52	14.29	7.72	2.54	12.89	1.63	0.01	3.48
Khartoum	-0.81	-1.00	-0.61	14.61	9.98	19.25	11.92	6.79	17.04	2.56	0.75	4.37
North Darfur	-1.09	-1.39	-0.80	19.11	10.89	27.34	15.44	5.81	25.07	3.41	0.01	8.15
North Kordofan	-0.83	-0.97	-0.70	11.75	8.11	15.39	10.26	6.47	14.04	1.41	0.33	2.50
Northern	-0.88	-1.08	-0.68	16.46	11.19	21.72	12.82	7.12	18.53	3.47	0.92	6.02
Red Sea	-1.12	-1.40	-0.83	24.88	16.02	33.75	14.05	3.02	25.08	10.95	2.99	18.91
River Nile	-0.89	-1.08	-0.69	19.59	14.34	24.84	13.99	7.34	20.63	5.53	1.74	9.31
Sennar	-0.67	-0.82	-0.52	10.40	5.85	14.95	8.90	4.12	13.68	1.44	0.01	2.88
South Darfur	-0.92	-1.12	-0.71	15.03	8.50	21.56	12.38	5.41	19.36	2.59	0.01	5.33
South Kordofan	-0.51	-0.70	-0.33	7.83	3.26	12.39	6.78	2.29	11.27	0.94	0.01	2.20
West Darfur	-0.59	-0.79	-0.40	10.86	6.26	15.47	8.88	3.97	13.79	1.97	0.30	3.64
West Kordofan	-0.80	-0.95	-0.65	12.20	7.34	17.06	10.22	5.16	15.28	1.90	0.01	3.82
White Nile	-0.51	-0.66	-0.37	9.56	6.20	12.92	7.90	4.21	11.59	1.59	0.28	2.89
Sudan	-0.76	-0.96	-0.57	13.60	8.16	19.04	10.78	4.69	16.87	2.72	0.01	5.58

TABLE 8: Mean weight-for-height Z-score (WHZ) and wasting by WHZ by locality and by state

Location	Mean WHZ %			WHZ < -2 %			WHZ between -3 and -2 %			WHZ < -3		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	-1.00	-1.21	-0.80	23.67	18.68	28.34	15.93	8.89	21.87	7.62	4.19	11.64
El Golid	-0.90	-1.08	-0.73	14.73	9.61	20.64	12.46	5.85	17.73	2.69	1.01	5.40
Merwoe	-0.80	-0.96	-0.64	11.84	6.46	16.18	10.26	4.90	14.93	1.37	0.31	2.94
El Daba	-0.95	-1.17	-0.69	15.77	11.70	20.18	13.38	8.95	18.27	2.20	1.00	3.71
Halfa	-0.55	-0.69	-0.42	7.22	3.30	11.98	6.14	2.02	10.55	0.95	0.27	2.35
Delgo	-1.06	-1.27	-0.80	19.62	12.66	28.15	15.59	8.53	24.50	3.65	1.53	7.36
El Burgaig	-0.78	-0.93	-0.59	16.85	12.19	21.91	13.09	7.68	19.11	3.63	1.74	6.10
Northern State	-0.88	-1.08	-0.68	16.46	11.19	21.72	12.82	7.12	18.53	3.47	0.92	6.02
El Matama	-1.00	-1.14	-0.84	21.77	16.95	28.25	16.44	10.90	23.29	5.07	3.07	8.52
Shendi	-1.06	-1.24	-0.86	21.57	16.19	25.56	16.74	11.35	21.31	4.71	2.75	7.10

TABLE 8: Mean weight-for-height Z-score (WHZ) and wasting by WHZ by locality and by state

Location	Mean WHZ %			WHZ < -2 %			WHZ between -3 and -2 %			WHZ < -3		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Hamad	-1.24	-1.59	-0.90	33.92	26.93	42.93	16.71	4.93	27.77	17.11	9.88	25.97
Barbar	-1.07	-1.26	-0.88	23.31	17.01	29.34	16.14	7.17	23.84	6.79	3.08	12.34
El Damar	-0.50	-0.66	-0.38	11.29	8.60	14.94	9.05	6.28	12.84	2.09	1.13	3.40
Atbara	-0.55	-0.73	-0.38	11.47	6.68	15.36	9.32	4.23	13.15	2.17	0.86	3.63
El Buhaira	-1.45	-1.59	-1.31	29.29	23.73	34.25	21.87	14.75	27.64	7.30	4.18	9.99
River Nile State	-0.89	-1.08	-0.69	19.59	14.34	24.84	13.99	7.34	20.63	5.53	1.74	9.31
Khartoum	-0.71	-0.85	-0.56	11.60	7.80	17.62	9.90	5.52	16.44	1.67	0.55	4.21
Bahri	-0.99	-1.28	-0.71	18.26	11.55	26.94	14.59	6.90	23.50	3.58	1.65	9.11
Um Durman	-0.78	-0.96	-0.55	15.70	11.42	21.26	12.11	7.12	17.86	3.48	1.74	6.73
Um Bada	-0.70	-0.85	-0.54	14.01	10.53	17.50	11.48	7.87	15.19	2.47	1.24	3.95
Jebel Awlia	-0.92	-1.14	-0.70	16.13	10.79	20.75	12.88	7.33	17.96	3.13	1.41	5.51
Sharg Elneel	-0.67	-0.84	-0.48	9.72	5.53	15.88	8.54	3.68	15.00	1.11	0.32	3.54
Karrari	-0.89	-1.01	-0.79	16.78	13.65	20.12	13.75	10.39	18.02	2.92	1.64	4.53
Khartoum State	-0.81	-1.00	-0.61	14.61	9.98	19.25	11.92	6.79	17.04	2.56	0.75	4.37
Greater Medani	-0.71	-0.85	-0.57	10.58	7.16	14.08	9.18	5.45	13.03	1.30	0.53	2.51
Ganub Elgazira	-0.51	-0.65	-0.38	9.30	6.16	12.56	8.06	4.83	11.37	1.27	0.47	2.59
El Hassahisa	-0.65	-0.80	-0.53	10.43	4.19	15.70	9.06	2.54	14.57	1.33	0.23	3.67
El Kamlin	-0.27	-0.47	0.00	7.03	3.98	10.58	6.01	2.93	9.55	1.02	0.31	2.35
Sharg El Gezira	-0.66	-0.82	-0.47	10.55	7.63	14.74	9.19	6.01	13.79	1.25	0.49	2.71
Um Elqura	-0.86	-0.98	-0.71	11.92	7.75	17.40	10.40	6.20	16.03	1.44	0.64	3.33
El Manaqil	-0.52	-0.68	-0.35	9.10	5.27	12.51	7.83	4.06	11.16	1.37	0.37	2.49
El Qurashi	-0.86	-1.07	-0.66	15.25	10.57	20.92	12.40	7.13	18.08	2.78	1.20	5.26
Al-Gazeera State	-0.61	-0.77	-0.44	10.44	6.18	14.70	8.90	4.46	13.35	1.45	0.10	2.80
Sennar	-0.61	-0.71	-0.50	8.49	5.86	10.87	7.60	4.92	9.99	0.88	0.40	1.54
Sharg Sennar	-0.79	-0.95	-0.67	11.33	6.36	16.96	9.66	4.51	15.44	1.57	0.41	3.02
Sinja	-0.55	-0.66	-0.45	8.12	5.90	10.86	7.28	4.93	10.23	0.83	0.38	1.69
Abu Hujar	-0.79	-0.96	-0.64	10.49	5.37	14.96	9.24	3.95	13.85	1.21	0.22	2.78
El Dali	-0.82	-0.94	-0.71	14.55	9.91	19.68	12.22	6.83	17.78	2.25	1.17	4.51
Es Suki	-0.61	-0.83	-0.40	10.92	5.08	15.69	8.93	3.11	14.17	1.97	0.52	3.63
Ed Dinder	-0.65	-0.80	-0.50	11.49	6.28	19.17	9.47	3.42	16.79	1.89	0.62	4.78
Sennar State	-0.67	-0.82	-0.52	10.40	5.85	14.95	8.90	4.12	13.68	1.44	0.01	2.88
Ed Damazine	-0.37	-0.51	-0.23	5.73	3.27	8.87	5.19	2.75	8.41	0.52	0.15	1.27
El Tadamon	-0.55	-0.77	-0.34	12.80	5.93	17.76	9.91	2.21	16.06	2.58	0.77	5.57
El Roseiris	-0.38	-0.53	-0.23	8.74	6.36	11.79	7.34	4.78	10.63	1.34	0.66	2.65
Baw	-0.34	-0.54	-0.10	3.04	1.50	7.81	2.71	0.61	7.69	0.22	0.05	1.33
Geisan	-0.42	-0.64	-0.23	3.91	0.91	10.26	3.59	0.49	9.94	0.19	0.01	1.37
El Kurmuk	-0.47	-0.66	-0.28	5.93	3.04	9.92	5.45	2.46	9.36	0.45	0.07	1.60

TABLE 8: Mean weight-for-height Z-score (WHZ) and wasting by WHZ by locality and by state

Location	Mean WHZ %			WHZ < -2 %			WHZ between -3 and -2 %			WHZ < -3		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Wad El Mahi	-0.69	-0.80	-0.58	10.19	5.74	14.63	8.83	4.39	13.40	1.52	0.47	3.01
Blue Nile State	-0.44	-0.61	-0.27	7.02	3.25	10.79	6.01	2.10	9.92	0.92	0.01	2.12
Kosti	-0.56	-0.68	-0.43	9.64	6.65	12.88	8.09	5.26	11.52	1.39	0.60	2.71
Guli	-0.64	-0.84	-0.43	11.85	8.56	15.81	9.77	6.40	14.17	1.95	0.82	3.60
Tendalti	-0.28	-0.44	-0.11	6.55	4.03	9.88	5.61	3.00	9.22	0.82	0.28	1.80
Es Salam	-0.75	-0.89	-0.62	9.78	5.88	14.37	8.44	4.44	13.26	1.23	0.42	2.81
Rabak	-0.59	-0.70	-0.45	8.87	5.97	11.79	7.62	4.62	10.62	1.22	0.55	2.15
El Jabalain	-0.26	-0.44	-0.11	5.47	2.59	9.77	4.84	1.68	9.13	0.58	0.17	1.68
El Diwaim	-0.62	-0.74	-0.50	16.65	13.26	19.83	12.57	8.61	16.19	4.06	2.27	6.18
Um Rimta	-0.39	-0.54	-0.24	6.14	2.43	8.94	5.43	1.85	8.35	0.59	0.09	1.54
El Gitaina	-0.43	-0.59	-0.27	6.65	4.16	9.94	5.88	3.20	9.15	0.77	0.22	2.22
White Nile State	-0.51	-0.66	-0.37	9.56	6.20	12.92	7.90	4.21	11.59	1.59	0.28	2.89
Port Sudan	-0.46	-0.63	-0.28	8.41	4.50	13.97	7.01	3.00	12.83	1.27	0.33	3.63
Swakin	-0.77	-0.97	-0.59	11.65	7.99	17.80	9.87	5.92	16.02	1.74	0.76	3.80
El Gonob Welawlaib	-0.50	-0.74	-0.22	10.51	6.81	17.06	8.43	3.97	14.59	1.86	0.79	4.62
Sinkat	-0.98	-1.28	-0.69	26.97	20.46	35.96	16.59	7.84	26.48	10.53	6.31	15.78
Haya	-1.93	-2.40	-1.57	45.32	34.02	58.49	17.42	1.75	34.18	28.54	17.15	41.00
Dordieb	-1.20	-1.56	-0.88	22.49	13.19	37.18	15.18	0.44	30.33	7.33	2.53	17.60
Tokar	-1.37	-1.58	-1.18	32.03	23.03	38.81	20.02	10.08	29.06	11.84	6.49	18.05
Agig	-1.12	-1.29	-0.95	23.27	16.08	29.31	17.09	8.90	24.54	6.09	2.71	10.42
Gabaot Elma-aadin	-1.04	-1.27	-0.80	16.72	8.85	23.48	13.25	4.64	21.61	3.49	0.66	6.89
Halaeeb (accessible parts)	-0.98	-1.25	-0.74	19.26	7.46	29.74	15.06	1.95	26.32	4.23	0.45	10.87
Red Sea State	-1.12	-1.40	-0.83	24.88	16.02	33.75	14.05	3.02	25.08	10.95	2.99	18.91
Kassala Town	-0.83	-0.99	-0.67	16.56	10.77	21.89	12.24	4.97	18.00	4.46	1.78	7.45
Refi Kassla	-0.68	-0.79	-0.57	8.35	5.60	11.18	7.60	4.69	10.36	0.75	0.34	1.32
Rural Western Kassala	-0.23	-0.38	-0.09	3.13	1.45	6.06	2.90	1.17	5.65	0.20	0.04	0.67
New Halfa	-0.24	-0.39	-0.10	6.10	3.57	9.43	5.33	2.58	8.67	0.69	0.21	1.63
Refi Nahr Atbara	-0.53	-0.65	-0.39	3.80	1.75	7.32	3.65	1.56	7.21	0.17	0.04	0.56
Rural Khashm Elgirba	-0.34	-0.52	-0.17	3.95	1.51	7.63	3.77	1.22	7.50	0.21	0.02	0.69
Rural Wad Elhilaiw	-0.56	-0.71	-0.41	7.50	4.82	10.86	6.63	3.74	10.11	0.79	0.29	1.77
Rural Aroma	-0.83	-1.03	-0.66	18.36	12.51	25.87	13.11	5.74	20.97	5.37	2.31	8.93
Refi North Delta	-0.46	-0.67	-0.25	12.51	7.63	17.26	9.43	3.94	15.02	2.74	1.00	5.76
Refi Hamashkureib	-0.79	-0.93	-0.65	10.55	5.32	14.88	9.30	3.97	14.24	1.22	0.24	2.43

TABLE 8: Mean weight-for-height Z-score (WHZ) and wasting by WHZ by locality and by state

Location	Mean WHZ %			WHZ < -2 %			WHZ between -3 and -2 %			WHZ < -3		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Telkok	-0.68	-0.81	-0.53	6.40	3.79	9.71	5.91	3.43	9.44	0.37	0.14	1.11
Kassala State	-0.60	-0.76	-0.45	9.40	4.52	14.29	7.72	2.54	12.89	1.63	0.01	3.48
Gedaref Town	-0.72	-1.05	-0.44	16.64	8.26	24.64	11.83	2.53	21.52	4.64	1.00	9.81
Middle Geddaref	-0.47	-0.60	-0.33	7.60	4.20	13.29	6.62	2.46	12.00	0.91	0.25	3.00
Elbutana	-0.70	-0.85	-0.55	9.04	5.31	12.99	8.14	3.93	11.93	0.94	0.29	2.06
El Fashaga	-0.30	-0.62	-0.11	11.26	7.71	19.27	8.54	3.55	17.93	2.46	1.12	6.87
El Rahad	0.10	-0.16	0.35	6.96	3.62	10.13	5.42	2.09	8.60	1.45	0.57	2.63
Gala-a El Nahal	-0.45	-0.62	-0.28	5.06	1.90	9.33	4.65	1.40	8.90	0.37	0.04	1.45
El Fao	-0.58	-0.78	-0.40	11.77	6.61	21.43	8.82	1.28	18.18	2.89	0.87	9.98
El Qureisha	-0.33	-0.44	-0.20	7.76	4.15	11.58	6.52	2.56	10.47	1.31	0.29	2.68
El Mafaza	-0.62	-0.81	-0.41	7.04	4.10	11.41	6.27	3.12	10.72	0.71	0.16	1.89
Basunda	-0.77	-0.96	-0.50	14.28	8.94	19.17	11.47	6.17	16.46	2.63	1.04	4.95
Western Galabat	-0.77	-0.98	-0.56	19.78	14.35	26.95	13.12	6.39	20.86	6.56	2.91	11.19
Eastern Galabat	-0.45	-0.68	-0.27	9.37	5.00	16.00	7.81	2.61	14.19	1.58	0.47	4.75
Al-Gadarif State	-0.50	-0.72	-0.28	10.98	5.33	16.62	8.38	2.12	14.64	2.35	0.01	5.04
Sheikan	-0.80	-0.87	-0.72	11.59	9.73	14.42	10.23	8.21	12.98	1.36	0.88	2.10
Um Rawaba	-0.74	-0.88	-0.62	9.17	6.35	12.09	8.25	5.56	11.35	0.83	0.31	1.58
Um Dam Haj Ahmed	-0.81	-0.98	-0.59	15.11	10.78	20.54	12.51	7.69	17.81	2.46	1.17	4.87
El Rahad	-0.88	-0.99	-0.76	9.72	5.71	13.25	8.91	4.70	12.58	0.72	0.21	1.63
Bara	-0.90	-1.06	-0.75	12.65	8.51	17.93	11.01	6.61	16.51	1.45	0.63	3.31
Gharb Bara	-0.93	-1.08	-0.80	16.22	11.36	20.37	13.48	8.81	17.88	2.75	1.37	4.50
Soudari	-0.80	-0.99	-0.63	11.64	6.90	16.75	9.94	4.95	15.20	1.52	0.54	3.51
Gebrat El Sheikh	-0.92	-1.02	-0.80	11.32	7.63	17.06	10.49	6.53	15.84	0.89	0.32	2.25
North Kordofan State	-0.83	-0.97	-0.70	11.75	8.11	15.39	10.26	6.47	14.04	1.41	0.33	2.50
Kadugli	-0.61	-0.71	-0.51	9.02	6.21	12.28	7.89	4.90	11.20	0.98	0.48	1.98
Reif Shargi	-0.71	-0.82	-0.57	10.15	7.06	13.38	9.15	5.75	12.48	0.97	0.37	2.06
Dilling	-0.51	-0.72	-0.29	7.17	3.60	11.16	6.41	2.76	10.50	0.71	0.14	1.83
El Quoz	-0.58	-0.72	-0.43	7.06	4.43	10.24	6.35	3.72	9.64	0.60	0.22	1.51
Habila	-0.49	-0.59	-0.38	5.21	2.82	8.51	4.75	2.44	8.10	0.41	0.11	1.00
Abassiya	-0.31	-0.48	-0.12	6.40	3.04	10.86	5.60	2.16	10.21	0.78	0.16	1.81
El Rashad	-0.41	-0.63	-0.20	7.81	3.52	11.54	6.80	2.59	10.89	0.99	0.23	2.35
Abu Jubaiha	-0.52	-0.69	-0.30	11.65	6.75	16.41	9.64	4.20	14.24	2.10	0.83	4.36
El Tadamon	-0.62	-0.76	-0.50	8.37	5.92	11.69	7.50	4.84	10.70	0.78	0.35	1.60
Talodi	-0.87	-1.20	-0.54	11.97	2.86	20.73	10.39	0.63	19.41	1.55	0.11	5.31
Ghadeer	-0.79	-0.95	-0.63	9.57	4.96	15.26	8.49	3.73	14.22	0.94	0.17	2.49
El Leri	-0.35	-0.52	-0.19	5.29	2.53	10.06	4.69	1.84	9.69	0.44	0.13	1.39

TABLE 8: Mean weight-for-height Z-score (WHZ) and wasting by WHZ by locality and by state

Location	Mean WHZ %			WHZ < -2 %			WHZ between -3 and -2 %			WHZ < -3		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Karshola	-0.29	-0.45	-0.11	3.55	1.61	6.25	3.34	1.37	6.07	0.19	0.04	0.68
Delami	-0.30	-0.50	-0.12	3.55	1.00	7.66	3.23	0.69	7.25	0.20	0.02	0.73
South Kordofan State	-0.51	-0.70	-0.33	7.83	3.26	12.39	6.78	2.29	11.27	0.94	0.01	2.20
Abu Zabad	-0.76	-0.92	-0.57	13.66	9.67	17.89	11.19	6.77	15.90	2.44	1.07	4.16
ElKhiwai	-0.76	-0.88	-0.66	8.70	5.39	11.99	7.85	4.61	11.24	0.77	0.23	1.82
Ghubaish	-0.80	-0.95	-0.62	12.51	7.40	18.11	10.74	5.10	15.54	1.72	0.66	3.72
El Nuhud	-0.92	-1.05	-0.80	13.19	9.58	16.93	11.44	7.60	15.77	1.73	0.78	3.00
El Idia	-0.80	-0.91	-0.70	8.67	5.64	13.42	7.89	4.71	12.40	0.68	0.20	1.85
Wad Benda	-0.86	-1.03	-0.71	13.73	9.20	18.57	11.45	7.07	16.80	2.01	1.00	4.14
Lagawa	-0.65	-0.79	-0.51	9.77	6.20	14.40	8.65	4.92	13.18	1.04	0.35	2.52
Elsunut	-0.73	-0.89	-0.56	11.72	7.53	15.76	9.85	5.54	14.50	1.70	0.64	3.04
Keilik	-0.84	-0.94	-0.75	11.16	8.10	13.98	9.91	7.08	12.63	1.13	0.51	1.90
Es Salam	-0.50	-0.63	-0.37	7.12	4.59	9.34	6.40	3.68	8.67	0.67	0.22	1.23
Babanusa	-0.77	-0.92	-0.65	13.91	8.70	19.41	11.42	5.89	16.87	2.51	0.89	5.11
Abyei	-0.70	-0.84	-0.57	10.28	6.71	14.51	9.04	4.65	13.58	1.21	0.37	2.77
El Dibab	-1.01	-1.35	-0.72	22.58	12.99	31.68	15.35	3.76	25.15	7.67	2.30	13.18
El Meiram	-0.84	-1.04	-0.65	15.67	7.41	27.13	11.49	2.12	23.22	3.73	0.65	10.20
West Kordofan State	-0.80	-0.95	-0.65	12.20	7.34	17.06	10.22	5.16	15.28	1.90	0.01	3.82
El Fasher	-1.22	-1.33	-1.11	22.68	18.16	26.63	18.14	13.60	22.83	4.50	2.60	6.05
Tawila	-0.80	-0.94	-0.68	8.35	5.33	12.44	7.80	4.66	11.69	0.58	0.21	1.36
Melit	-1.42	-1.59	-1.20	29.79	24.02	35.98	23.61	17.33	30.16	6.14	4.24	9.19
Um Kadada	-1.00	-1.17	-0.86	13.88	9.27	19.84	12.06	7.19	18.65	1.60	0.58	3.80
Kebkabiya	-1.05	-1.20	-0.88	18.19	13.64	22.79	14.02	8.14	19.11	4.21	2.10	7.28
Kutum	-1.21	-1.32	-1.08	21.08	13.97	26.00	17.94	10.69	22.89	3.26	1.52	5.02
El Mahalha	-1.27	-1.42	-1.15	17.14	10.82	26.71	15.40	8.29	25.58	1.44	0.48	5.17
Saraf Omra	-0.75	-0.88	-0.62	9.72	6.05	13.46	8.41	4.65	12.64	1.12	0.48	2.71
El Serief	-0.86	-1.00	-0.69	11.95	8.51	15.73	10.74	7.11	14.59	1.10	0.51	2.18
Dar Elsalam	-1.03	-1.16	-0.90	19.45	15.22	22.98	15.51	10.67	19.59	4.00	1.95	5.73
Kelemando	-1.14	-1.26	-1.01	20.85	15.84	25.15	17.28	11.66	21.95	3.47	1.75	5.83
El Tawisha	-1.17	-1.28	-1.04	21.29	14.64	25.46	17.55	10.50	22.38	3.87	1.52	5.67
Um Baru	-0.87	-1.07	-0.63	11.02	2.57	19.08	9.52	1.43	17.63	1.08	0.09	4.85
El Lait	-1.15	-1.30	-0.99	19.70	14.02	25.29	16.54	9.69	22.81	3.00	1.19	6.13
ELkuma	-1.09	-1.33	-0.88	21.11	14.02	27.84	17.73	9.06	24.39	3.49	1.20	7.72
El Tina	-1.11	-2.46	0.32	24.85	0.22	54.17	11.45	-23.44	47.19	8.72	0.00	34.80
Kernoi	-1.22	-1.32	-1.11	28.03	21.54	31.30	21.42	14.76	25.92	6.28	3.65	9.01
North Darfur State	-1.09	-1.39	-0.80	19.11	10.89	27.34	15.44	5.81	25.07	3.41	0.01	8.15

TABLE 8: Mean weight-for-height Z-score (WHZ) and wasting by WHZ by locality and by state

Location	Mean WHZ %			WHZ < -2 %			WHZ between -3 and -2 %			WHZ < -3		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nyala South	-1.20	-1.37	-1.04	20.99	14.43	28.53	16.22	8.35	24.19	4.65	2.25	9.13
Nyala North	-1.22	-1.65	-0.83	20.78	12.34	34.94	16.64	3.33	31.13	3.94	0.76	13.00
Es Salam	-0.90	-1.00	-0.78	12.90	8.87	16.75	11.41	7.20	15.60	1.55	0.54	2.88
El Wihda	-0.98	-1.13	-0.85	10.55	7.66	17.93	9.67	6.11	16.53	0.78	0.33	2.82
Mershing	-0.99	-1.13	-0.83	15.07	10.84	19.21	12.64	8.20	17.76	2.49	1.18	4.17
Beliel	-0.73	-0.83	-0.62	10.72	7.51	13.94	9.39	5.90	12.73	1.32	0.66	2.33
Nitega	-0.97	-1.21	-0.76	16.76	10.89	25.00	13.47	6.33	21.21	3.11	1.00	9.23
Sharg El Jabal (accessible parts)	-0.93	-1.89	0.24	37.15	8.77	53.21	19.90	-13.34	45.44	17.00	0.42	36.72
Kas	-1.07	-1.20	-0.95	18.33	13.12	23.26	15.35	9.56	20.60	2.95	1.53	4.94
Shattaya	-1.35	-1.47	-1.24	26.32	21.51	30.38	21.20	15.81	25.55	5.21	3.37	7.87
Buram	-0.77	-0.93	-0.63	12.13	7.74	16.42	10.49	5.96	14.95	1.56	0.55	2.86
Gereida	-0.83	-0.95	-0.69	14.45	11.08	18.01	12.08	8.51	16.02	2.22	1.17	3.63
El Sunta	-0.60	-0.72	-0.47	7.26	3.97	10.93	6.66	3.22	10.32	0.57	0.14	1.52
El Radoum	-0.72	-0.86	-0.56	10.62	6.83	14.83	9.30	5.14	13.68	1.21	0.56	2.52
Tulus	-0.88	-1.09	-0.68	12.01	6.76	20.30	10.44	5.13	19.10	1.29	0.28	4.17
Damso	-1.06	-1.20	-0.93	19.96	13.93	25.01	16.09	9.22	21.71	3.78	1.35	6.51
Ed Elfursan	-0.66	-0.80	-0.52	13.13	8.56	17.08	10.82	5.87	15.34	2.20	0.75	4.10
Kubum	-0.86	-1.00	-0.71	17.04	13.11	20.77	13.51	9.66	17.31	3.42	1.84	5.24
Kateila	-0.75	-0.94	-0.58	15.24	10.16	20.08	12.37	6.78	17.21	2.85	1.28	5.06
Rehaid Elbirdi	-0.78	-0.91	-0.65	8.69	3.86	13.01	8.07	3.14	12.54	0.61	0.13	1.57
Um Dafoug	-0.77	-0.90	-0.62	7.50	4.61	11.36	7.04	4.17	10.84	0.43	0.17	1.03
South Darfur State	-0.92	-1.12	-0.71	15.03	8.50	21.56	12.38	5.41	19.36	2.59	0.01	5.33
Abu Jabra	-0.75	-0.93	-0.57	13.26	8.55	19.02	10.91	5.86	16.57	2.23	0.96	4.29
Abu Karinka	-0.72	-0.85	-0.57	10.38	5.65	14.50	9.18	4.32	13.43	1.09	0.29	2.51
Bahr El Arab	-1.02	-1.21	-0.85	24.26	16.14	31.21	17.26	9.02	25.63	6.54	3.06	10.69
Adila	-0.94	-1.08	-0.78	20.17	15.09	26.39	14.92	8.17	21.52	4.95	2.62	9.50
Ed Dain	-0.61	-0.82	-0.42	12.94	8.09	18.74	10.01	4.37	16.31	2.86	1.15	5.40
Assalaya	-1.11	-1.28	-0.94	19.99	15.49	24.09	16.21	10.71	20.84	3.92	2.10	6.60
El Firdous	-0.79	-0.94	-0.66	13.00	7.79	17.19	10.99	5.94	15.75	1.77	0.67	3.49
Shia-ria	-1.70	-1.91	-1.49	43.47	37.30	46.74	22.54	14.79	29.80	20.62	15.20	24.81
Yassin	-1.01	-1.29	-0.72	22.09	14.17	28.99	15.22	4.58	23.87	6.57	2.59	13.17
East Darfur State	-0.94	-1.12	-0.75	18.93	13.18	24.68	13.90	7.18	20.63	4.91	1.87	7.95
El Geneina	-0.71	-0.85	-0.59	11.79	8.99	15.47	9.69	6.51	13.09	2.00	1.04	3.59
Habila	-0.33	-0.59	-0.11	8.11	5.10	10.85	6.88	3.94	9.57	1.18	0.53	2.26
Kulbus	-0.93	-1.12	-0.78	21.10	15.24	27.37	14.93	7.09	22.55	6.02	3.05	10.14

TABLE 8: Mean weight-for-height Z-score (WHZ) and wasting by WHZ by locality and by state

Location	Mean WHZ %			WHZ < -2 %			WHZ between -3 and -2 %			WHZ < -3		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Beida	-0.74	-0.84	-0.63	9.17	5.65	12.73	8.11	4.58	11.94	0.88	0.27	1.93
Foro Baranga	0.10	-0.27	0.48	6.48	1.29	16.10	4.83	-1.57	14.32	1.25	0.10	5.93
Kereneik	-0.52	-0.64	-0.40	7.75	5.39	10.72	6.73	4.49	9.79	0.94	0.41	1.68
Sirba	-0.59	-0.76	-0.38	9.31	5.79	13.28	8.26	4.29	12.34	1.10	0.40	2.54
Jebel Moon	-0.48	-0.62	-0.33	7.83	5.25	12.06	6.96	3.75	11.25	0.84	0.24	2.34
West Darfur State	-0.59	-0.79	-0.40	10.86	6.26	15.47	8.88	3.97	13.79	1.97	0.30	3.64
Zalingi	-0.83	-1.01	-0.66	15.29	11.84	20.58	11.74	7.82	17.09	3.40	1.89	6.09
Wadi Salih	-0.84	-1.03	-0.59	21.15	16.16	27.49	14.59	8.52	22.32	6.33	3.73	10.24
Mukjar	-0.65	-0.81	-0.48	12.91	8.13	17.72	10.42	5.10	15.32	2.29	0.82	4.83
Central Jebel Mara	-0.60	-0.85	-0.39	12.17	5.31	18.86	10.09	2.43	17.30	1.98	0.41	5.12
North Jebel Mara	-0.90	-1.12	-0.66	17.70	8.18	26.93	14.20	2.84	24.89	3.32	0.52	9.10
Bendasi	-0.98	-1.18	-0.76	15.52	10.51	21.12	13.12	7.51	18.27	2.39	1.06	4.66
Nertiti	-0.75	-0.90	-0.60	13.44	10.20	17.66	11.04	7.56	14.81	2.45	1.23	3.99
Azum	-0.96	-1.13	-0.73	17.80	13.89	22.69	14.62	10.05	19.80	3.29	1.59	5.60
Um Dukhun	-0.99	-1.25	-0.76	20.71	10.66	28.02	14.44	2.64	23.41	5.48	1.23	11.72
Central Darfur State	s	-1.04	-0.60	16.46	9.03	23.89	12.65	4.64	20.66	3.65	0.16	7.14

Spatial distribution of wasting (by WHZ)

Figures 41 to 48 show the spatial distribution of wasting.

FIGURE 41:
Child: Mean WHZ (raster)

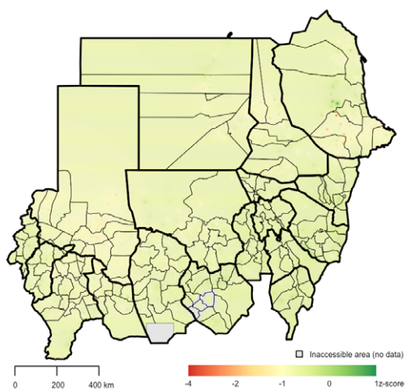


FIGURE 42:
Child: Mean WHZ

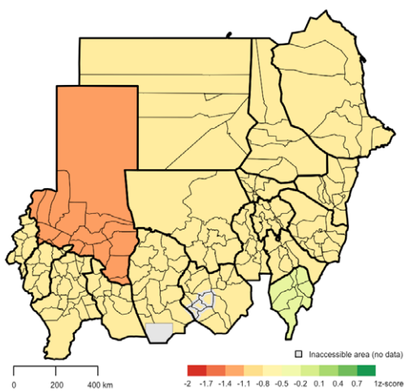


FIGURE 43:
Child: WHZ < -2 (raster)

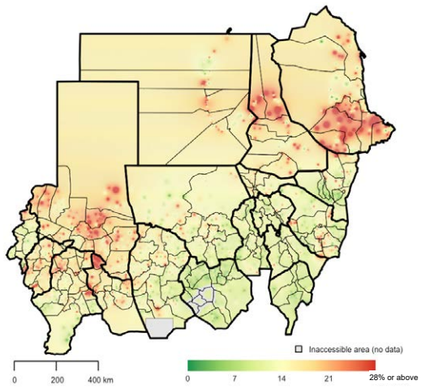


FIGURE 44:
Child: WHZ < -2

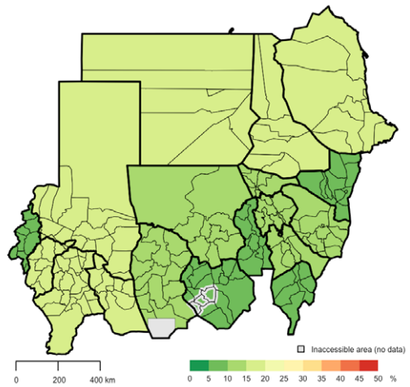


FIGURE 45:
Child: WHZ between -3 and -2 (raster)

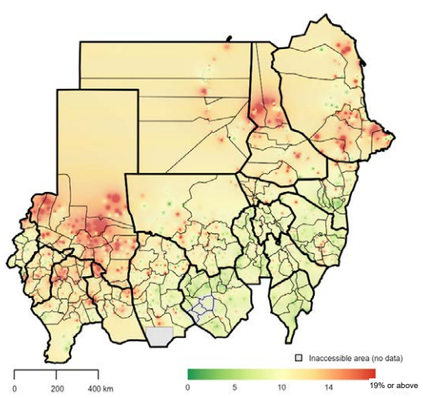


FIGURE 46:
Child: WHZ between -3 and -2

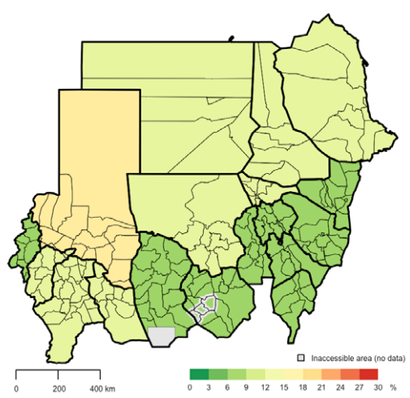


FIGURE 47:
Child: WHZ < -3 (raster)

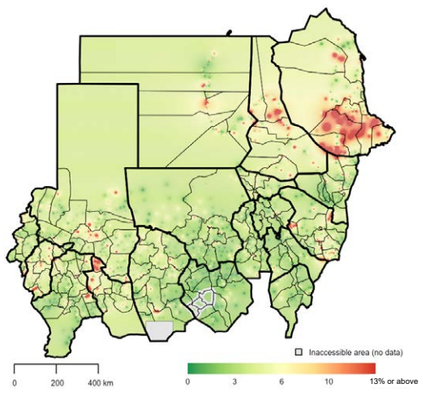
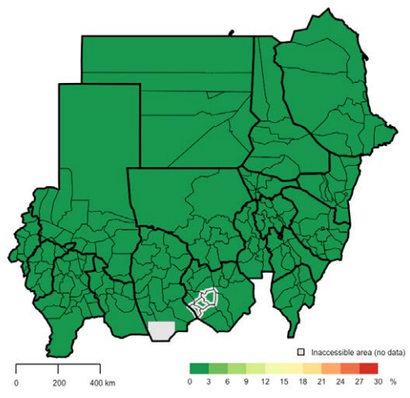


FIGURE 48:
Child: WHZ < -3



3.1.5 Nutritional oedema

Oedema prevalence average results

Nutritional oedema prevalence was at 0.18 per cent (95 per cent CI: 0.01-0.86 per cent) across Sudan.

West Darfur and North Darfur states had the highest prevalence of nutritional oedema, significantly higher than all other states *(see Figure 49)*. Among localities, 34 had significantly higher rates of oedema than the rest of the localities *(see Figure 49)*. About 72.9 per cent had no cases of nutritional oedema found during the survey.

Table 9 and Table 10 present results per locality, per state and at the national level for nutritional oedema prevalence.

FIGURE 49: Box plot of state results of child nutritional oedema

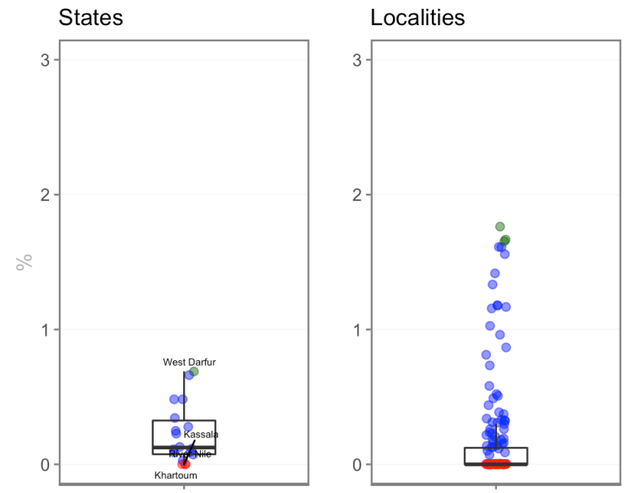


TABLE 9: Nutritional oedema prevalence by state and national

State	Estimate	95% LCL	95% UCL
Al-Gadarif	0.28	0.01	1.11
Al-Gazeera	0.09	0.01	0.59
BlueNile	0.09	0.01	0.53
Central Darfur	0.34	0.01	1.21
East Darfur	0.25	0.01	1.10
Kassala	0.00	0.00	0.04
Khartoum	0.00	0.00	0.13
North Darfur	0.66	0.01	1.68

TABLE 9: Nutritional oedema prevalence by state and national

State	Estimate	95% LCL	95% UCL
North Kordofan	0.03	0.01	0.23
Northern	0.48	0.01	1.80
Red Sea	0.48	0.01	1.64
River Nile	0.00	0.00	0.09
Sennar	0.12	0.01	0.60
South Darfur	0.23	0.01	1.05
South Kordofan	0.13	0.01	0.66
West Darfur	0.69	0.01	2.42
West Kordofan	0.07	0.01	0.40
White Nile	0.11	0.01	0.47
National	0.18	0.01	0.86

TABLE 10: Nutritional oedema prevalence by locality and by state

Location	Estimate	95% LCL	95% UCL
Basunda	1.52	0.00	4.17
Eastern Galabat	0.92	0.00	2.64
El Fao	0.00	0.00	0.00
El Fashaga	0.00	0.00	0.00
El Mafaza	0.00	0.00	0.00
El Qureisha	0.00	0.00	0.39
El Rahad	0.00	0.00	0.00
Elbutana	0.00	0.00	0.00
Gala-a El Nahal	0.00	0.00	0.00
Gedaref Town	0.63	0.00	1.71
Middle Geddaref	0.00	0.00	0.00
Western Galabat	0.00	0.00	0.00
Al-Gadarif state	0.28	0.01	1.11
El Hassahisa	0.00	0.00	0.00
El Kamlin	0.00	0.00	0.50
El Manaqil	0.00	0.00	0.80
El Qurashi	0.33	0.00	1.50
Ganub Elgazira	0.20	0.00	1.13
Greater Medani	0.00	0.00	0.00
Sharg El Gezira	0.00	0.00	0.00
Um Elqura	0.45	0.00	1.25

TABLE 10: Nutritional oedema prevalence by locality and by state

Location	Estimate	95% LCL	95% UCL
Al-Gazeera state	0.09	0.01	0.59
Baw	0.00	0.00	0.00
Ed Damazine	0.00	0.00	0.00
El Kurmuk	0.00	0.00	1.20
El Roseiris	0.09	0.00	0.52
El Tadamon	0.51	0.00	1.52
Geisan	0.48	0.00	1.61
Wad El Mahi	0.00	0.00	0.51
Blue Nile state	0.09	0.01	0.53
Azum	0.38	0.00	1.23
Bendasi	0.00	0.00	0.00
Central Jebel Mara	0.00	0.00	0.00
Mukjar	0.00	0.00	0.00
Nertiti	1.30	0.51	2.59
North Jebel Mara	1.05	0.00	3.70
Um Dukhun	0.00	0.00	0.31
Wadi Salih	0.24	0.00	0.86
Zalingi	0.88	0.29	1.97
Central Darfur state	0.34	0.01	1.21
Abu Jabra	0.00	0.00	0.00
Abu Karinka	0.00	0.00	0.00
Adila	1.43	0.00	3.95
Assalaya	0.00	0.00	0.00
Bahr El Arab	0.00	0.00	0.80
Ed Dain	0.42	0.00	1.68
El Firdous	0.00	0.00	0.68
Shia-ria	0.36	0.00	1.39
Yassin	0.00	0.00	0.00
East Darfur state	0.25	0.01	1.10
Kassala Town	0.00	0.00	0.00
New Halfa	0.00	0.00	0.00
Refi Hamashkureib	0.00	0.00	0.00
Refi Kassla	0.00	0.00	0.00
RefiNahr Atbara	0.00	0.00	0.00
Refi North Delta	0.00	0.00	0.00
Rural Aroma	0.00	0.00	0.00

TABLE 10: Nutritional oedema prevalence by locality and by state

Location	Estimate	95% LCL	95% UCL
Rural Khashm Elgirba	0.00	0.00	0.00
Rural Telkok	0.00	0.00	0.00
Rural Wad Elhilaiw	0.00	0.00	0.50
Rural Western Kassala	0.00	0.00	0.00
Kassala state	0.00	0.00	0.04
Bahri	0.00	0.00	0.00
Jebel Awlia	0.00	0.00	0.55
Karrari	0.00	0.00	0.44
Khartoum	0.00	0.00	0.32
Sharg Elneel	0.00	0.00	0.32
Um Bada	0.00	0.00	0.00
Um Durman	0.00	0.00	0.00
Khartoum state	0.00	0.00	0.13
Dar Elsalam	0.00	0.00	0.53
El Fasher	1.28	0.11	3.09
El Lait	0.00	0.00	0.00
El Mahalha	0.00	0.00	0.00
El Serief	0.95	0.16	1.97
El Tawisha	0.00	0.00	0.00
El Tina	0.00	0.00	0.00
ELkuma	0.00	0.00	0.00
Kebkabiya	2.03	0.41	4.08
Kelemando	0.00	0.00	0.00
Kernoi	0.00	0.00	0.00
Kutum	0.87	0.13	2.23
Melit	0.00	0.00	0.00
Saraf Omra	1.24	0.19	2.98
Tawila	0.00	0.00	0.00
Um Baru	0.00	0.00	0.00
Um Kadada	0.00	0.00	0.28
North Darfur state	0.66	0.01	1.68
Bara	0.00	0.00	0.00
El Rahad	0.00	0.00	0.00
Gebrat El Sheikh	0.00	0.00	0.00
Gharb Bara	0.00	0.00	0.00

TABLE 10: Nutritional oedema prevalence by locality and by state

Location	Estimate	95% LCL	95% UCL
Sheikan	0.00	0.00	0.00
Soudari	0.12	0.00	0.67
Um Dam Haj Ahmed	0.00	0.00	0.00
Um Rawaba	0.09	0.00	0.52
North Kordofan state	0.03	0.01	0.23
Delgo	0.00	0.00	0.48
Dongola	0.00	0.00	0.00
El Burgaig	0.36	0.00	1.27
El Daba	1.95	0.35	5.38
El Golid	0.38	0.00	1.50
Halfa	0.00	0.00	0.00
Merwoe	0.00	0.00	0.53
Northern state	0.48	0.01	1.80
Agig	1.59	0.36	3.05
Dordieb	0.00	0.00	0.00
El Gonob Welawlaib	0.00	0.00	0.72
Gabaot Elma-aadin	0.25	0.00	1.61
Halaeeb (accessible parts)	0.00	0.00	0.00
Haya	1.28	0.00	3.96
Port Sudan	0.00	0.00	0.59
Sinkat	0.59	0.00	1.47
Swakin	0.00	0.00	0.00
Tokar	0.00	0.00	0.00
Red Sea state	0.48	0.01	1.64
Abu Hamad	0.00	0.00	0.00
Atbara	0.00	0.00	0.00
Barbar	0.00	0.00	0.00
El Buhaira	0.00	0.00	0.35
El Damar	0.00	0.00	0.00
El Matama	0.00	0.00	0.50
Shendi	0.00	0.00	0.00
River Nile state	0.00	0.00	0.09
Abu Hujar	0.75	0.00	2.33
Ed Dinder	0.00	0.00	0.00
El Dali	0.12	0.00	0.64

TABLE 10: Nutritional oedema prevalence by locality and by state

Location	Estimate	95% LCL	95% UCL
Es Suki	0.14	0.00	0.70
Sennar	0.09	0.00	0.56
Sharg Sennar	0.00	0.00	0.78
Sinja	0.00	0.00	0.00
Sennar state	0.12	0.01	0.60
Beliel	0.00	0.00	0.00
Buram	0.00	0.00	0.00
Damso	0.00	0.00	0.00
Ed Elfursan	0.00	0.00	0.00
El Radoum	0.00	0.00	0.00
El Sunta	0.00	0.00	0.00
El Wihda	0.00	0.00	0.00
Es Salam	0.00	0.00	0.00
Gereida	0.00	0.00	0.00
Kas	0.00	0.00	0.00
Kateila	0.00	0.00	0.00
Kubum	0.00	0.00	0.00
Mershing	0.00	0.00	0.00
Nitega	0.00	0.00	0.00
Nyala North	0.00	0.00	0.00
Nyala South	0.52	0.00	1.17
Rehaid Elbirdi	0.00	0.00	0.00
Sharg El Jabal (accessible parts)	0.00	0.00	0.00
Shattaya	0.15	0.00	0.77
Tulus	1.62	0.24	5.56
Um Dafoug	0.00	0.00	0.00
South Darfur state	0.23	0.01	1.05
Abassiya	0.13	0.00	0.68
Abu Jubaiha	0.00	0.00	0.64
Abu Karshola	0.00	0.00	0.56
Delami	0.00	0.00	0.00
Dilling	0.48	0.00	1.92
El Leri	0.00	0.00	0.00
El Quoz	0.38	0.00	1.15
El Rashad	0.00	0.00	0.54

TABLE 10: Nutritional oedema prevalence by locality and by state

Location	Estimate	95% LCL	95% UCL
El Tadamon	0.00	0.00	0.00
Ghadeer	0.00	0.00	0.00
Habila	0.00	0.00	0.00
Kadugli	0.18	0.00	0.88
Reif Shargi	0.44	0.00	1.19
Talodi	0.00	0.00	1.47
South Kordofan state	0.13	0.01	0.66
Beida	0.00	0.00	0.00
El Geneina	1.99	0.00	5.77
Foro Baranga	0.29	0.00	1.04
Habila	0.00	0.00	0.00
Jebel Moon	0.56	0.00	1.50
Kereneik	0.22	0.00	0.66
Kulbus	0.00	0.00	0.00
Sirba	0.00	0.00	0.00
West Darfur state	0.69	0.01	2.42
Abu Zabad	0.40	0.00	1.05
Abyei	0.00	0.00	0.00
Babanusa	0.00	0.00	0.00
El Dibab	0.00	0.00	0.00
El Idia	0.00	0.00	0.00
El Meiram	0.00	0.00	0.00
El Nuhud	0.09	0.00	0.61
ElKhiwai	0.30	0.00	1.07
Elsunut	0.00	0.00	0.00
Es Salam	0.26	0.00	0.83
Ghubaish	0.00	0.00	0.00
Keilik	0.00	0.00	0.00
Lagawa	0.17	0.00	0.94
Wad Benda	0.00	0.00	0.52
West Kordofan state	0.07	0.01	0.40
El Diwaim	0.00	0.00	0.00
El Gitaina	0.00	0.00	0.00
El Jabalain	0.00	0.00	0.00
Es Salam	0.00	0.00	0.28

TABLE 10: Nutritional oedema prevalence by locality and by state

Location	Estimate	95% LCL	95% UCL
Guli	0.00	0.00	0.00
Kosti	0.00	0.00	0.00
Rabak	0.82	0.10	2.04
Tendalti	0.15	0.00	0.89
Um Rimta	0.00	0.00	0.00
White Nile state	0.11	0.01	0.47

Spatial distribution of oedema

Low prevalence of oedema, as expected, is spread evenly throughout Sudan with small areas of higher prevalence (up to 2 per cent) in Red Sea, Northern, Al-Gadarif and the Darfur states *(see Figure 50)*.

FIGURE 50:
Child: Oedema (raster)

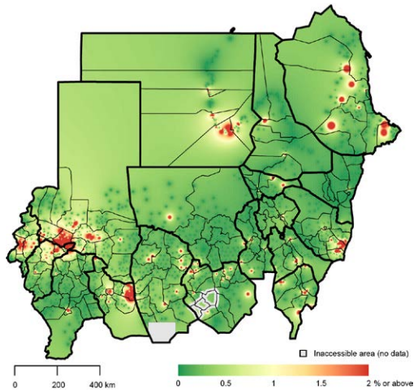
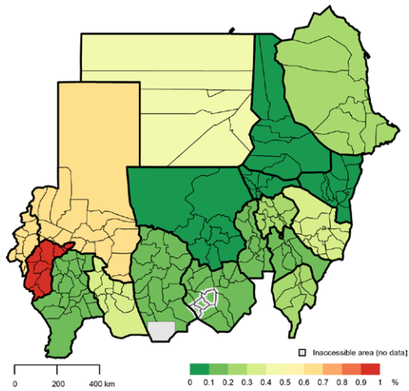


FIGURE 51:
Child: Oedema



3.1.6 Childhood obesity and overweight

Childhood obesity and overweight average results

Child overweight prevalence was 2.14 per cent (95 per cent CI: 0.01-4.42 per cent) across Sudan. Child obesity prevalence was 0.85 per cent (95 per cent CI: 0.01-2.66 per cent).

Among the states, Al-Gadarif state had the highest prevalence of overweight and obese children *(see Figure 52)*. About 3.7 per cent of localities had a prevalence of overweight children in excess of 5 per cent, while only 1.6 per cent of localities had a prevalence of child obesity in excess of 5 per cent *(see Figure 53)*.

Table 11 and Table 12 present results per locality, per state and at the national level for child overweight and child obesity.

FIGURE 52: Box plot of state results for child overweight and obesity

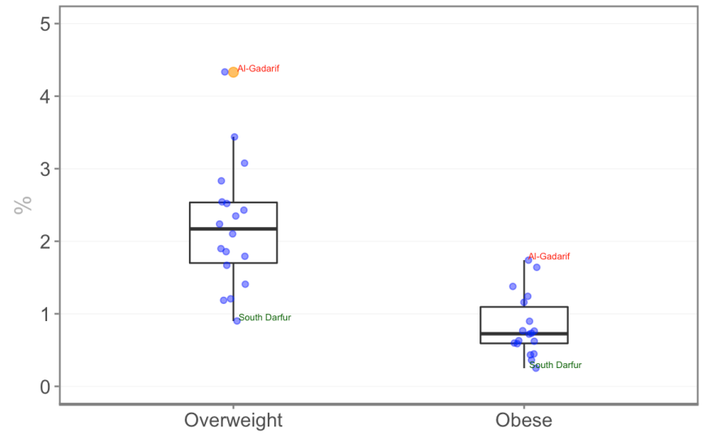


FIGURE 53: Box plot of locality results for child overweight and obesity

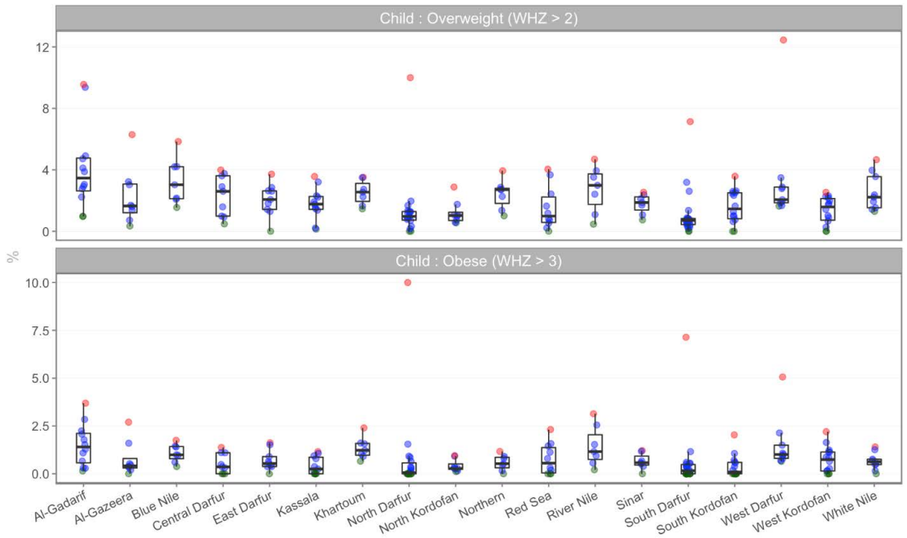


TABLE 11: Overweight and obesity prevalence by state and national

State	Overweight %			Obesity %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	4.33	1.62	7.04	1.74	0.14	3.33
Al-Gazeera	2.35	0.54	4.17	0.76	0.01	1.82

TABLE 11: Overweight and obesity prevalence by state and national

State	Overweight %			Obesity %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Blue Nile	3.44	1.41	5.48	1.16	0.01	2.32
Central Darfur	2.24	0.08	4.39	0.60	0.01	1.36
East Darfur	1.86	0.17	3.55	0.77	0.01	1.77
Kassala	1.41	0.05	2.77	0.43	0.01	1.10
Khartoum	2.52	0.61	4.43	1.38	0.01	2.75
North Darfur	1.19	0.01	6.73	0.63	0.01	6.12
North Kordofan	1.21	0.19	2.24	0.36	0.01	1.00
Northern	2.43	0.45	4.41	0.59	0.01	1.52
Red Sea	1.79	0.01	3.79	0.72	0.01	1.87
River Nile	3.08	1.13	5.02	1.64	0.22	3.06
Sennar	1.90	0.53	3.27	0.73	0.01	1.60
South Darfur	0.90	0.01	2.62	0.25	0.01	1.42
South Kordofan	2.10	0.27	3.93	0.45	0.01	1.26
West Darfur	2.83	0.87	4.80	1.24	0.01	2.51
West Kordofan	1.67	0.26	3.08	0.90	0.01	1.96
White Nile	2.54	0.89	4.19	0.62	0.01	1.49
National	2.14	0.01	4.42	0.85	0.01	2.66

TABLE 12: Overweight and obesity prevalence by locality and by state

Location	Child: Overweight (WHZ > 2)			Child: Obese (WHZ > 3)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	2.58	1.04	4.93	0.46	0.00	1.41
El Golid	2.21	0.45	4.54	1.11	0.00	2.90
Merwoe	1.31	0.25	3.21	0.00	0.00	0.79
El Daba	3.04	1.16	5.92	0.92	0.00	2.38
Halfa	2.74	1.41	4.21	1.05	0.26	2.02
Delgo	1.19	0.18	2.61	0.18	0.00	1.05
El Burgaig	3.90	1.95	6.43	0.75	0.00	2.53
Northern State	2.43	0.45	4.41	0.59	0.01	1.52
El Matama	2.16	1.05	3.86	0.97	0.16	2.04
Shendi	1.20	0.30	2.64	0.62	0.00	1.42
Abu Hamad	4.58	1.96	7.94	2.35	0.57	4.61
Barbar	3.85	1.51	6.64	2.42	0.76	4.85

TABLE 12: Overweight and obesity prevalence by locality and by state

Location	Child: Overweight (WHZ > 2)			Child: Obese (WHZ > 3)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Damar	4.86	3.12	6.99	2.33	1.12	3.84
Atbara	2.97	1.31	4.70	1.76	0.75	3.02
El Buhaira	0.55	0.00	1.45	0.12	0.00	0.68
River Nile State	3.08	1.13	5.02	1.64	0.22	3.06
Khartoum	3.26	1.50	5.55	1.58	0.54	3.01
Bahri	1.80	0.42	3.61	1.40	0.20	3.00
Um Durman	2.62	0.68	5.57	1.34	0.00	4.14
Um Bada	3.26	1.80	5.32	2.09	0.87	3.68
Jebel Awlia	2.64	0.91	5.28	1.08	0.19	2.70
Sharg Elneel	2.04	0.48	4.10	0.87	0.15	2.25
Karrari	1.71	0.48	3.02	0.80	0.00	1.94
Khartoum State	2.52	0.61	4.43	1.38	0.01	2.75
Greater Medani	0.32	0.00	1.28	0.00	0.00	0.00
Ganub Elgazira	1.95	0.71	3.46	0.62	0.00	1.95
El Hassahisa	0.85	0.00	2.06	0.52	0.00	1.54
El Kamlin	5.69	2.38	9.82	2.34	0.69	4.78
Sharg El Gezira	3.21	1.40	5.59	0.47	0.00	1.33
Um Elqura	1.19	0.34	2.52	0.00	0.00	0.52
El Manaqil	3.13	1.88	4.79	1.28	0.30	2.62
El Qurashi	1.50	0.38	3.21	0.21	0.00	1.18
Al-Gazeera State	2.35	0.54	4.17	0.76	0.01	1.82
Sennar	1.71	0.87	2.79	1.11	0.48	2.32
Sharg Sennar	0.66	0.00	1.62	0.39	0.00	1.14
Sinja	2.13	1.10	3.52	0.66	0.11	1.46
Abu Hujar	1.41	0.23	3.24	0.00	0.00	0.35
El Dali	1.59	0.68	2.87	0.68	0.00	1.85
Es Suki	2.60	1.14	4.57	1.02	0.15	2.36
Ed Dinder	2.97	1.30	5.14	0.60	0.00	2.12
Sennar State	1.90	0.53	3.27	0.73	0.01	1.60
Ed Damazine	3.05	1.68	4.80	1.22	0.29	2.50
El Tadamon	4.07	2.18	6.80	1.41	0.51	3.08
El Roseiris	4.06	2.48	6.24	1.65	0.78	2.96
Baw	6.03	3.11	10.22	1.18	0.00	3.12
Geisan	2.51	1.22	4.00	1.02	0.17	2.00
El Kurmuk	1.55	0.23	4.13	0.40	0.00	1.80
Wad El Mahi	1.77	0.64	2.92	0.65	0.12	1.52
Blue Nile State	3.44	1.41	5.48	1.16	0.01	2.32

TABLE 12: Overweight and obesity prevalence by locality and by state

Location	Child: Overweight (WHZ > 2)			Child: Obese (WHZ > 3)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kosti	1.80	0.60	3.58	0.37	0.00	1.05
Guli	2.78	1.29	4.68	0.60	0.00	1.97
Tendalti	3.55	1.88	6.22	1.35	0.33	2.85
Es Salam	1.54	0.46	3.02	0.32	0.00	1.15
Rabak	1.54	0.54	2.76	0.74	0.11	1.68
El Jabalain	2.75	1.35	4.61	0.15	0.00	0.73
El Diwaim	4.23	2.31	6.67	0.83	0.00	2.61
Um Rimta	1.68	0.18	4.09	0.53	0.00	1.70
El Gitaina	2.51	0.92	4.87	0.65	0.00	1.81
White Nile State	2.54	0.89	4.19	0.62	0.01	1.49
Port Sudan	3.31	1.36	5.64	1.07	0.16	2.32
Swakin	1.08	0.28	2.54	1.01	0.14	2.32
El Gonob Welawlaib	3.02	0.59	6.71	0.62	0.00	2.25
Sinkat	3.77	1.66	6.34	2.03	0.69	4.20
Haya	1.00	0.00	3.13	0.34	0.00	2.32
Dordieb	1.17	0.34	2.60	1.23	0.20	2.86
Tokar	0.99	0.00	2.64	0.85	0.00	2.48
Agig	0.54	0.00	1.45	0.19	0.00	1.10
Gabaot Elma-aadin	0.76	0.00	2.30	0.29	0.00	1.53
Halaeeb (accessible parts)	0.00	0.00	3.67	0.00	0.00	3.03
Red Sea State	1.79	0.01	3.79	0.72	0.01	1.87
Kassala Town	1.61	0.63	3.21	0.36	0.00	1.02
Refi Kassla	1.74	0.65	3.07	1.10	0.38	2.13
Rural Western Kassala	2.28	1.05	3.76	1.08	0.22	2.55
New Halfa	2.25	0.99	3.93	0.88	0.13	2.01
Refi Nahr Atbara	1.23	0.00	3.69	0.00	0.00	0.33
Rural Khashm Elgirba	2.06	0.77	3.70	0.90	0.16	2.04
Rural Wad Elhilaiw	2.98	1.31	5.00	0.38	0.00	1.01
Rural Aroma	0.92	0.15	2.09	0.00	0.00	0.77
Refi North Delta	2.44	0.96	4.94	0.20	0.00	0.95
Refi Hamashkureib	0.27	0.00	0.89	0.14	0.00	0.81
Rural Telkok	0.21	0.00	1.25	0.00	0.00	0.96
Kassala State	1.41	0.05	2.77	0.43	0.01	1.10
Gedaref Town	2.30	0.97	4.15	1.41	0.41	3.14

TABLE 12: Overweight and obesity prevalence by locality and by state

Location	Child: Overweight (WHZ > 2)			Child: Obese (WHZ > 3)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Middle Geddaref	2.87	1.24	5.07	1.83	0.57	3.50
Elbutana	1.09	0.26	2.28	0.27	0.00	1.39
El Fashaga	9.41	5.47	13.97	2.91	1.31	4.72
El Rahad	10.46	6.10	15.58	4.63	2.27	7.98
Gala-a El Nahal	2.36	1.04	4.48	0.85	0.00	2.09
El Fao	4.37	2.87	6.35	1.50	0.54	2.57
El Qureisha	3.15	1.57	5.32	1.56	0.53	3.10
El Mafaza	1.42	0.31	3.02	0.47	0.00	1.80
Basunda	3.09	1.21	5.57	0.50	0.00	1.48
Western Galabat	5.01	2.60	8.00	2.23	0.96	4.07
Eastern Galabat	3.76	2.15	6.04	1.00	0.28	2.01
Al-Gadarif State	4.33	1.62	7.04	1.74	0.14	3.33
Sheikan	0.68	0.28	1.22	0.21	0.00	0.64
Um Rawaba	2.49	1.25	4.12	0.74	0.19	1.57
Um Dam Haj Ahmed	2.03	0.78	3.66	0.96	0.00	2.51
El Rahad	0.39	0.00	1.58	0.36	0.00	1.27
Bara	1.00	0.17	2.23	0.00	0.00	0.63
Gharb Bara	1.31	0.49	2.65	0.13	0.00	0.83
Soudari	0.49	0.00	1.46	0.12	0.00	0.61
Gebrat El Sheikh	1.77	0.44	3.31	0.55	0.00	1.33
North Kordofan State	1.21	0.19	2.24	0.36	0.01	1.00
Kadugli	1.04	0.44	1.99	0.20	0.00	0.75
Reif Shargi	2.25	0.94	4.07	0.93	0.15	2.15
Dilling	0.56	0.00	2.25	0.37	0.00	2.21
El Quoz	2.21	0.96	3.67	1.30	0.38	2.47
Habila	1.28	0.29	2.70	0.53	0.00	1.51
Abassiya	3.60	1.78	5.57	0.81	0.14	1.72
El Rashad	2.49	1.28	4.61	0.55	0.00	1.60
Abu Jubaiha	4.18	2.04	6.92	0.00	0.00	0.56
El Tadamon	1.11	0.25	2.39	0.64	0.00	1.36
Talodi	0.00	0.00	2.63	0.00	0.00	0.00
Ghadeer	1.31	0.24	3.66	0.00	0.00	0.54
El Leri	2.44	1.11	4.30	0.00	0.00	0.54
Abu Karshola	1.38	0.00	5.22	0.15	0.00	1.50
Delami	1.61	0.27	3.54	0.00	0.00	1.75

TABLE 12: Overweight and obesity prevalence by locality and by state

Location	Child: Overweight (WHZ > 2)			Child: Obese (WHZ > 3)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Kordofan State	2.10	0.27	3.93	0.45	0.01	1.26
Abu Zabad	2.09	0.71	4.23	0.89	0.15	2.02
ElKhiwai	1.15	0.17	2.36	0.16	0.00	1.03
Ghubaish	2.00	0.88	3.61	1.40	0.42	2.57
El Nuhud	2.26	1.22	3.68	1.26	0.51	2.26
El Idia	0.26	0.00	0.95	0.26	0.00	0.95
Wad Benda	1.68	0.54	3.26	0.13	0.00	0.70
Lagawa	2.33	0.76	4.27	2.15	0.51	4.38
Elsunut	2.08	0.83	3.92	1.40	0.36	2.92
Keilik	0.82	0.16	1.75	0.00	0.00	0.33
Es Salam	2.88	1.37	5.03	0.73	0.18	1.54
Babanusa	1.29	0.33	2.48	1.06	0.17	2.24
Abyei	0.00	0.00	0.00	0.00	0.00	0.00
El Dibab	2.25	0.33	5.66	2.21	0.37	5.05
El Meiram	0.84	0.00	3.06	0.89	0.00	3.30
West Kordofan State	1.67	0.26	3.08	0.90	0.01	1.96
El Fasher	0.71	0.21	1.58	0.17	0.00	0.53
Tawila	1.00	0.16	2.37	0.69	0.00	1.81
Melit	0.00	0.00	0.44	0.00	0.00	0.55
Um Kadada	0.97	0.28	1.90	0.68	0.10	1.55
Kebkabiya	1.93	0.56	4.17	1.56	0.39	3.07
Kutum	0.66	0.00	1.77	0.00	0.00	0.00
El Mahalha	0.00	0.00	0.00	0.00	0.00	0.00
Saraf Omra	1.19	0.19	2.57	0.19	0.00	1.11
El Serief	0.68	0.00	1.74	0.17	0.00	0.85
Dar Elsalam	0.56	0.00	1.66	0.00	0.00	0.20
Kelemando	1.43	0.42	3.07	0.67	0.13	1.66
El Tawisha	0.16	0.00	0.98	0.00	0.00	0.00
Um Baru	0.94	0.00	2.48	0.00	0.00	0.00
El Lait	1.08	0.18	2.35	0.00	0.00	0.84
ELkuma	1.67	0.00	4.05	0.00	0.00	1.19
El Tina	10.00	0.00	30.00	10.00	0.00	30.00
Kernoi	1.73	0.85	2.87	0.83	0.10	1.92
North Darfur State	1.19	0.01	6.73	0.63	0.01	6.12
Nyala South	0.14	0.00	0.74	0.00	0.00	0.00

TABLE 12: Overweight and obesity prevalence by locality and by state

Location	Child: Overweight (WHZ > 2)			Child: Obese (WHZ > 3)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nyala North	0.58	0.00	3.35	0.00	0.00	3.45
Es Salam	0.75	0.12	1.76	0.24	0.00	0.92
El Wihda	0.25	0.00	1.52	0.00	0.00	1.11
Mershing	0.71	0.00	1.84	0.47	0.00	1.41
Beliel	0.83	0.24	1.58	0.08	0.00	0.43
Nitega	1.43	0.21	3.05	1.01	0.00	2.63
Sharg El Jabal (accessible parts)	7.14	0.00	25.08	7.14	0.00	23.10
Kas	0.87	0.23	1.96	0.00	0.00	0.00
Shattaya	0.62	0.00	1.67	0.30	0.00	1.04
Buram	0.70	0.00	1.73	0.00	0.00	0.37
Gereida	0.67	0.00	1.74	0.39	0.00	1.08
El Sunta	0.68	0.00	2.09	0.44	0.00	1.59
El Radoum	0.71	0.12	1.62	0.00	0.00	0.47
Tulus	0.82	0.00	3.26	0.00	0.00	1.49
Damso	0.00	0.00	0.91	0.00	0.00	0.00
Ed Elfursan	3.37	1.66	5.49	0.54	0.00	1.45
Kubum	0.53	0.00	1.63	0.21	0.00	0.84
Kateila	2.62	1.31	4.79	0.35	0.00	1.36
Rehaid Elbirdi	0.43	0.00	1.24	0.00	0.00	0.00
Um Dafoug	0.75	0.14	1.82	0.60	0.00	1.50
South Darfur State	0.90	0.01	2.62	0.25	0.01	1.42
Abu Jabra	1.85	0.77	3.38	1.33	0.31	2.55
Abu Karinka	0.55	0.00	3.16	0.00	0.00	0.00
Bahr El Arab	2.74	0.90	5.07	1.56	0.29	3.66
Adila	2.57	1.03	4.83	0.89	0.13	2.12
Ed Dain	2.34	0.96	4.07	0.63	0.00	1.83
Assalaya	1.51	0.40	3.02	0.66	0.00	2.25
El Firdous	1.30	0.18	3.15	0.53	0.00	1.70
Shia-ria	1.39	0.21	3.11	0.21	0.00	1.67
Yassin	2.70	1.24	4.36	0.58	0.00	1.66
East Darfur State	1.86	0.17	3.55	0.77	0.01	1.77
El Geneina	1.29	0.46	2.40	0.33	0.00	1.00
Habila	3.09	1.45	5.04	1.61	0.47	3.28
Kulbus	1.85	0.50	3.52	0.68	0.00	1.87
Beida	1.66	0.76	2.72	0.88	0.24	1.83

TABLE 12: Overweight and obesity prevalence by locality and by state

Location	Child: Overweight (WHZ > 2)			Child: Obese (WHZ > 3)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Foro Baranga	9.82	5.49	14.85	3.81	1.84	6.27
Kereneik	2.17	1.13	3.26	0.78	0.16	1.67
Sirba	2.64	0.69	5.54	1.45	0.14	4.13
Jebel Moon	4.47	2.43	6.67	2.69	0.93	4.72
West Darfur State	2.83	0.87	4.80	1.24	0.01	2.51
Zalingi	2.86	1.79	4.40	0.99	0.43	1.84
Wadi Salih	3.72	2.03	5.81	1.38	0.51	2.38
Mukjar	2.94	0.91	5.73	1.11	0.31	2.92
Central Jebel Mara	0.94	0.00	3.87	0.00	0.00	0.00
North Jebel Mara	2.60	0.00	7.70	0.00	0.00	0.00
Bendasi	0.46	0.00	1.66	0.47	0.00	1.70
Nertiti	3.38	1.70	5.45	0.77	0.13	2.07
Azum	2.37	0.85	4.68	0.00	0.00	0.66
Um Dukhun	1.04	0.29	2.29	0.31	0.00	1.09
Central Darfur State	2.24	0.08	4.39	0.60	0.01	1.36

Spatial distribution of child overweight and obesity

The prevalence of overweight and obese children was low and was spread evenly throughout Sudan, with some small areas of higher prevalence (5 per cent at the highest) in Red Sea, River Nile, Al-Gadarif and Blue Nile states and some localities in Western Sudan *(see Figure 54 and Figure 56)*.

FIGURE 54:
Child: Overweight (WHZ > 2) (Raster)

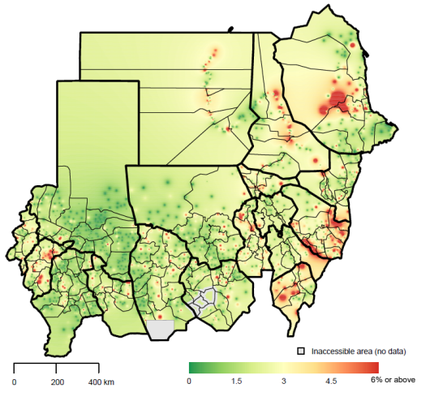


FIGURE 55:
Child: Overweight (WHZ > 2)

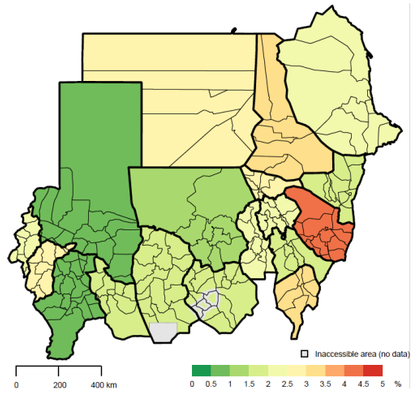


FIGURE 56:
Child: Obese (WHZ > 3) (raster)

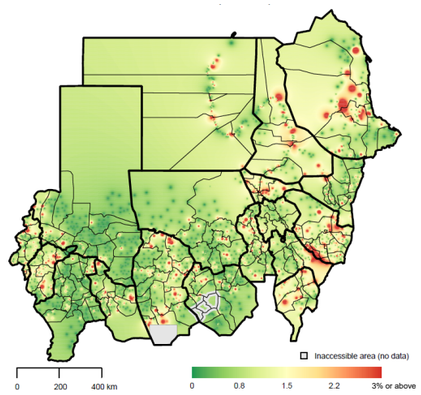
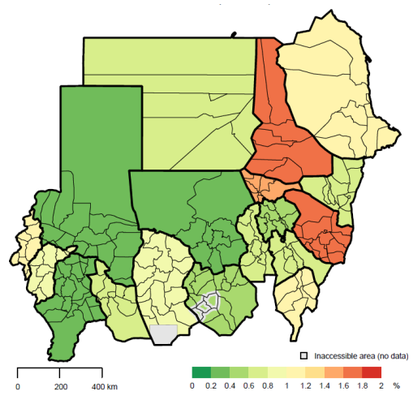


FIGURE 57:
Child: Obese (WHZ > 3)



3.2 Childhood anaemia

Childhood anaemia average results

Prevalence of any form of childhood anaemia[39] was 48.09 per cent (95 per cent CI: 41.08- 55.09 per cent) for the whole of Sudan. Across states, 33.3 per cent had more than 50 per cent of children with any form of anaemia. East Darfur state had the highest prevalence of any form of anaemia in children, while West Darfur had the lowest. Table 13 presents state and national estimates of the prevalence of any form of anaemia in children.

TABLE 13: Childhood anaemia by state and national

State	Haemoglobin (g/dl)			Any Anaemia %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	11.30	11.15	11.50	50.92	42.87	57.34
Al-Gazeera	11.20	10.85	11.40	47.81	40.81	54.93
Blue Nile	10.90	10.70	11.10	60.93	55.09	66.43
Central Darfur	11.10	10.55	11.80	45.25	37.32	54.45
East Darfur	10.60	10.40	10.90	66.44	60.05	73.71
Kassala	11.20	10.90	11.40	52.82	47.53	58.67
Khartoum	11.30	11.00	11.61	44.84	36.21	53.60
North Darfur	11.20	10.70	11.60	46.68	38.57	53.08
North Kordofan	11.20	11.00	11.40	51.49	45.71	56.92
Northern	11.30	11.10	11.60	44.69	37.49	51.53
Red Sea	11.00	10.80	11.30	54.96	46.96	61.25

[39] Among children 6 – 59 months of age.

TABLE 13: Childhood anaemia by state and national

State	Haemoglobin (g/dl)			Any Anaemia %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
River Nile	11.00	10.70	11.20	55.58	47.75	62.18
Sennar	11.20	11.00	11.40	50.15	44.76	55.52
South Darfur	11.60	11.30	11.90	41.44	34.35	48.91
South Kordofan	11.50	11.39	11.60	48.88	42.56	55.17
West Darfur	12.00	11.90	12.10	32.99	28.09	37.73
West Kordofan	11.70	11.30	12.10	40.20	32.38	48.33
White Nile	11.40	11.10	11.60	44.19	37.26	50.95
Sudan	11.27	10.99	11.55	48.09	41.08	55.09

Spatial distribution of prevalence of any form of anaemia in children

Moderate to high prevalence of anaemia was evenly spread throughout Sudan, but with small areas of low prevalence in Red Sea state, Kassala state, Northern state, South Kordofan, West Kordofan, and North, South, Central and West Darfur states *(see Figure 58).*

FIGURE 58:
Child: Haemoglobin (g/dl) (raster)

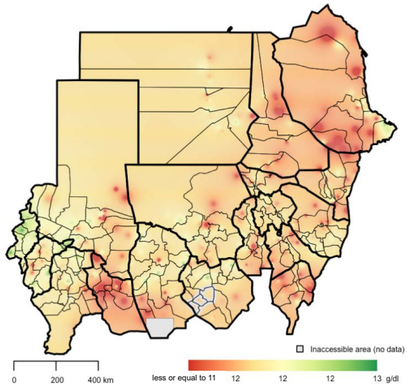


FIGURE 59:
Child: Haemoglobin (g/dl)

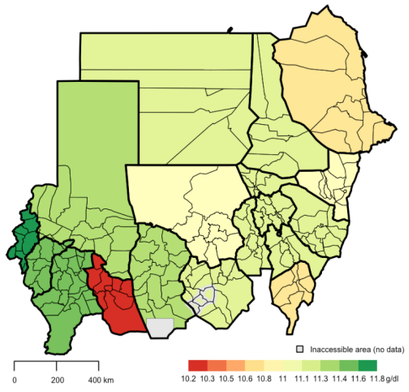


FIGURE 60:
Child: Any anaemia (raster)

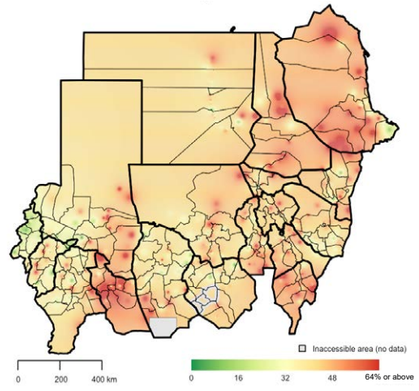
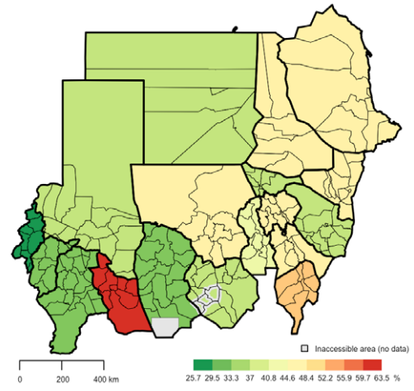


FIGURE 61:
Child: Any anaemia



Prevalence of mild, moderate and severe anaemia in children

The prevalence of mild and moderate anaemia in children was relatively high at 23.72 per cent (95 per cent CI: 18.32-29.13) and 22.52 per cent (95 per cent CI: 16.56 - 28.47 per cent) respectively. Severe anaemia prevalence in children was much lower at 1.68 per cent (95 per cent CI: 0.01-3.4 per cent). Across states, 83.3 per cent had more than 20 per cent of children with mild anaemia and 61.1 per cent had more than 20 per cent of children with moderate anaemia.

Table 14 presents state and national estimates of the prevalence of mild, moderate and severe anaemia in children.

TABLE 14: Childhood mild, moderate and severe anaemia by state and national

State	Mild anaemia %			Moderate anaemia %			Severe anaemia %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	26.40	21.89	31.59	21.08	16.74	25.93	3.22	1.36	5.63
Al-Gazeera	24.78	19.48	30.33	22.52	17.49	27.77	0.66	0.00	1.85
Blue Nile	27.56	23.04	31.53	31.22	26.37	36.87	2.11	0.76	3.90
Central Darfur	24.92	19.56	30.46	19.44	11.72	28.74	0.59	0.00	2.55
East Darfur	27.88	20.40	34.64	36.09	27.75	45.20	2.06	0.30	4.27
Kassala	22.34	17.97	26.60	28.25	23.79	33.57	1.99	0.68	3.60
Khartoum	20.26	15.49	26.11	22.54	16.65	29.28	1.76	0.24	4.51
North Darfur	27.04	21.57	31.82	17.24	12.16	22.05	2.03	0.73	3.64
North Kordofan	22.83	18.91	27.44	26.53	21.87	31.34	2.22	0.72	4.37
Northern	25.29	19.50	31.99	18.18	13.63	23.15	0.88	0.00	2.67
Red Sea	23.05	19.41	27.58	28.55	21.48	35.03	3.27	1.41	5.90

TABLE 14: Childhood mild, moderate and severe anaemia by state and national

State	Mild anaemia %			Moderate anaemia %			Severe anaemia %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
River Nile	27.75	22.13	33.80	26.71	20.04	32.73	1.25	0.20	2.93
Sennar	27.07	22.06	32.16	21.61	17.91	25.71	0.93	0.00	2.67
South Darfur	20.93	15.80	27.30	19.33	13.37	25.95	1.57	0.26	3.50
South Kordofan	21.37	15.92	26.83	24.29	18.78	30.12	2.70	1.05	4.61
West Darfur	15.72	11.73	19.18	16.49	12.33	21.94	0.47	0.00	1.37
West Kordofan	26.23	20.86	32.86	12.03	7.91	16.81	1.27	0.25	2.93
White Nile	25.64	20.57	30.41	16.77	10.90	23.22	1.18	0.00	3.32
Sudan	23.72	18.32	29.13	22.52	16.56	28.47	1.68	0.01	3.40

Spatial distribution of prevalence of childhood anaemia

Generally, high levels of mild anaemia were evenly spread across Sudan, but a scattering of localities throughout the country had a low prevalence *(see Figure 62).* A decreasing spatial trend of moderate anaemia could be noted from the east to west of the country, with the highest prevalence in Red Sea state and decreasing towards the Darfur states *(see Figure 64).*

There was generally a low prevalence of severe anaemia across the country, but with pockets of high prevalence in Red Sea state, Sennar state, Khartoum, Al-Gadarif state, Blue Nile, Kordofan and Darfur states *(see Figure 66).*

FIGURE 62:
Child: Mild anaemia (raster)

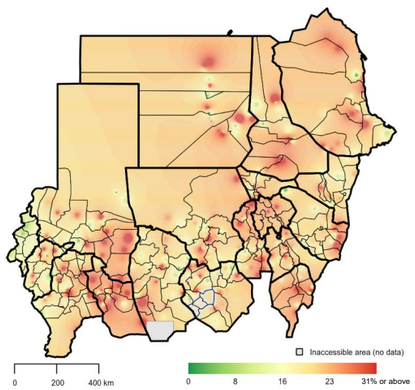


FIGURE 63:
Child: Mild anaemia

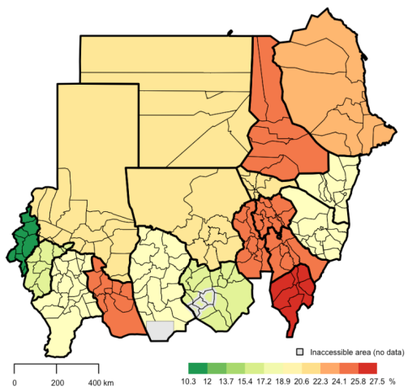


FIGURE 64:
Child: Moderate anaemia (raster)

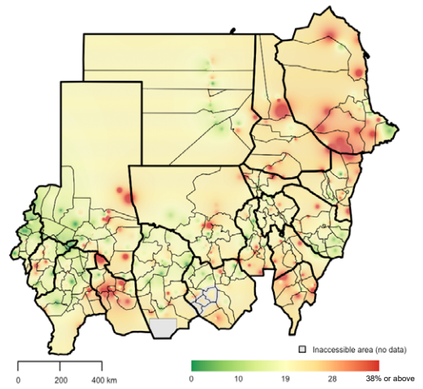


FIGURE 65:
Child: Moderate anaemia

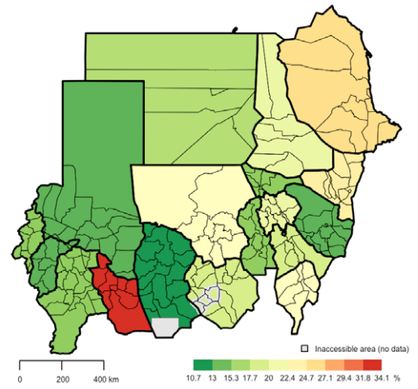


FIGURE 66:
Child: Severe anaemia (raster)

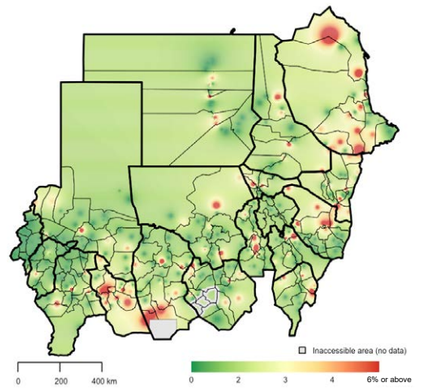
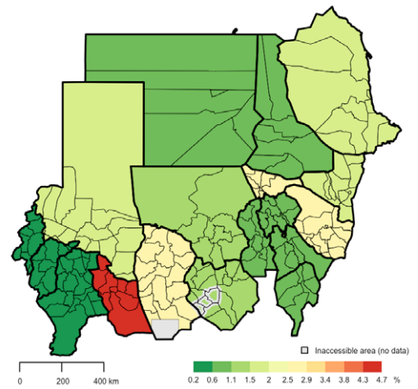


FIGURE 67:
Child: Severe anaemia



3.3 Infant and young child feeding

To assess infant and young child feeding, the infant and child feeding index (ICFI) was used. The ICFI is based on a version of an index devised by Mary Arimond and Marie Ruel of the International Food Policy Research Institute for the *2000 DHS Survey of Ethiopia* and subsequently developed by FANTA as a KPC2000+ indicator.[40]

The ICFI is a measure of appropriate IYCF practices. It is a score calculated as:
ICFI = Breast-feeding + Dietary diversity + Meal frequency

using age-specific weighting for each item. All children in the survey sample receive a score between zero and six. The ICFI score is summarized as follows:

[40] Arimond, Mary, and Marie T. Ruel, 'Summary Indicators for Infant and Child Feeding Practices: An Example from the Ethiopia Demographic and Health Survey 2000', Food and Nutrition Technical Assistance, Academy for Educational Development, 2002.

TABLE 15: The infant and child feeding index (ICFI) score

	Age-group (months)					
	6 - 8		9 -11		12 -24	
	Value	Score	Value	Score	Value	Score
Breastfed (24 Hours)	Yes	+2	Yes	+2	Yes	+1
Food groups (24 Hours)	1 ≥ 2	+1 +2	1 or 2 ≥ 3	+1 +2	2 or 3 ≥ 4	+1 +2
Meal frequency (24 Hours)	1 ≥ 2	+1 +2	1 or 2 ≥ 3	+1 +2	2 3 ≥ 4	+1 +2 +3

Infant and young child feeding (IYCF) is a summary indicator for recommended infant and young child feeding practices and is calculated based on the number of children whose feeding habits fall within the definition of each feeding practice category *(see Table 16)*.

TABLE 16: Good IYCF

	Classification	
	Good	Not Good
Children 0 – 5 months	Exclusively breastfed	Not exclusively breastfed
Children 6 – 23 months	ICFI = 6	ICFI < 6

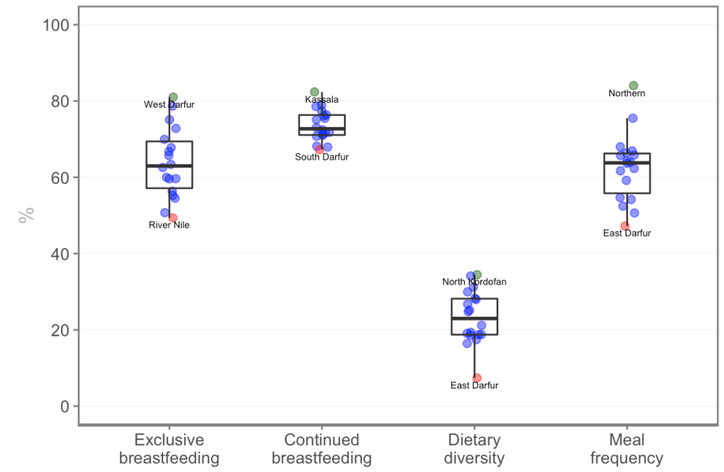
This is the primary indicator for monitoring and evaluating IYCF. A set of diagnostic indicators also is calculated, which shows the contribution of breast-feeding, dietary diversity and meal frequency to the calculated value of the primary indicator. This approach can be seen as a single indicator approach or as a hierarchical indicator approach. Such an approach is simpler and more useful than the multiple indicator approach that is used in, for example, Multiple Indicator Cluster Surveys (MICS) and Demographic and Health Surveys (DHS).

3.3.1 Infant and child feeding index

Exclusive breast-feeding and meal frequency average results

Exclusive breast-feeding was relatively high at 62.3 per cent (95 per cent CI: 44.0-80.6 per cent) for all of Sudan. Age-appropriate continuing breast-feeding was also high at 73.3 per cent (95 per cent CI: 65.1-81.5 per cent), as was age-appropriate meal frequency at 63.2 per cent (95 per cent CI: 52.5-74.0 per cent). Age-appropriate dietary diversity, on the other hand, was low at 25.4 per cent (95 per cent CI: 17.0-33.8 per cent). Across the states, exclusive breast-feeding was highest in West Darfur state and lowest in River Nile state. Age-appropriate continuing breast-feeding was highest in Kassala state and lowest in Central Darfur state. Age-appropriate dietary diversity was highest in North Kordofan state and lowest in East Darfur state. Age-appropriate meal frequency was highest in Northern state and lowest in East Darfur state. There was low inter-state variability across these ICFI component indicators *(see Figure 68)*.

FIGURE 68: Box plot of state results for ICFI component indicators



Across the localities, there was a lot of intra-state and inter-locality variance with exclusive breast-feeding, age-appropriate dietary diversity and age-appropriate meal frequency, but low intra-state and inter-state variability with age-appropriate continuing breast-feeding *(see Figure 69)*. Of all the localities, 40.2 per cent had more than 70 per cent of children who were exclusively breast-fed. This increased to 70.8 per cent of localities with more than 70 per cent of children who had age-appropriate continuing breast-feeding. Age-appropriate meal frequency, on the other hand, was practiced by more than 70 per cent of children in only 29.7 per cent of localities. None of the localities had more than 70 per cent of children who had age-appropriate dietary diversity.

Table 17 and Table 18 present results per locality, per state and at the national level for estimates of exclusive breast-feeding, age-appropriate continuing breast-feeding, age-appropriate dietary diversity and age-appropriate meal frequency.

FIGURE 69: Box plot of locality results for ICFI component indicators

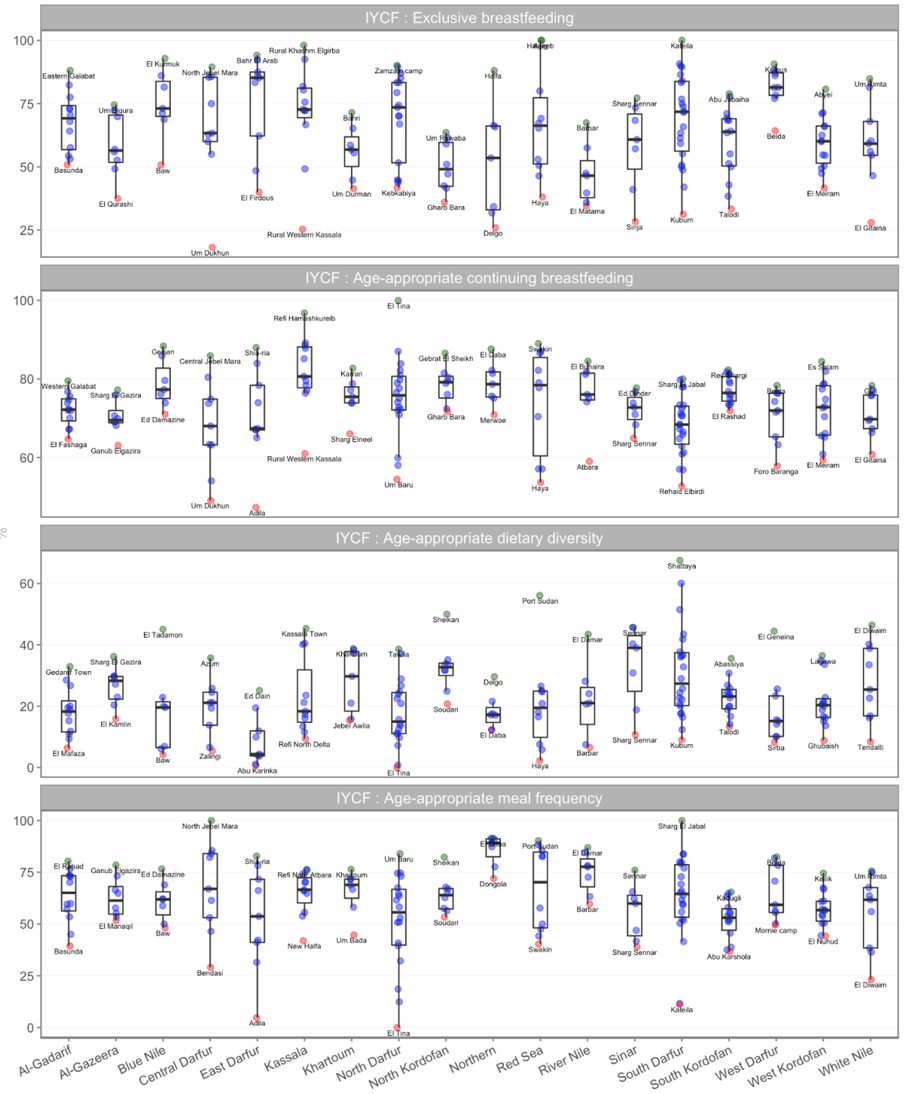


TABLE 17: ICFI component indicators by state and national

State	Exclusive Breast-feeding %			Continuing Breast-feeding %			Dietary Diversity %			Meal Frequency %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	66.77	47.18	86.36	72.42	64.01	80.84	18.74	11.42	26.06	64.24	54.13	74.35
Al-Gazeera	59.58	42.79	76.38	70.73	62.57	78.89	28.25	19.53	36.97	62.32	51.62	73.01
Blue Nile	75.09	60.65	89.53	77.37	70.57	84.18	18.60	12.42	24.78	63.64	53.33	73.96
Central Darfur	67.79	45.63	89.96	67.94	57.98	77.89	18.78	11.10	26.47	66.92	57.42	76.42
East Darfur	78.65	60.87	96.42	68.13	59.61	76.65	7.39	2.68	12.09	47.22	38.41	56.02
Kassala	72.82	58.68	86.96	82.37	75.74	89.01	26.74	18.84	34.64	63.94	53.06	74.82
Khartoum	55.27	35.29	75.26	75.13	67.27	83.00	27.96	19.28	36.63	65.71	53.77	77.64
North Darfur	65.73	50.81	80.66	76.39	68.61	84.17	17.43	9.98	24.87	50.65	38.97	62.33
North Kordofan	54.52	41.08	67.97	78.96	72.75	85.18	34.47	25.42	43.51	68.00	58.38	77.62
Northern	50.72	32.29	69.14	78.54	70.42	86.67	16.43	8.21	24.66	84.03	76.28	91.78
Red Sea	62.57	36.46	88.69	71.79	58.97	84.60	19.34	11.84	26.84	66.38	53.63	79.13
River Nile	49.36	33.75	64.97	75.47	68.74	82.20	25.16	17.66	32.65	75.48	67.05	83.91
Sennar	59.99	44.92	75.07	71.72	64.09	79.35	34.13	23.41	44.86	59.20	50.27	68.13
South Darfur	69.95	50.63	89.28	67.24	57.37	77.12	29.97	19.52	40.42	61.69	52.86	70.52
South Kordofan	63.39	47.54	79.24	76.12	68.28	83.96	24.78	16.21	33.35	52.43	40.28	64.59
West Darfur	81.01	67.98	94.03	71.05	62.94	79.16	19.08	11.14	27.01	65.83	55.67	75.98
West Kordofan	59.65	40.55	78.76	73.01	65.35	80.66	21.18	13.41	28.95	54.18	42.25	66.12
White Nile	56.33	32.20	80.47	71.21	63.92	78.51	31.24	23.60	38.88	54.68	43.59	65.77
Sudan	62.36	44.02	80.70	73.50	65.27	81.73	25.12	16.76	33.49	62.16	51.49	72.84

TABLE 18: ICFI component indicators by locality and state

Location	Exclusive Breast-feeding %			Continuing Breast-feeding %			Dietary Diversity %			Meal Frequency %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	64.75	52.36	76.19	75.08	68.42	82.35	16.00	9.03	24.44	68.75	58.97	78.10
El Golid	34.52	24.19	46.81	82.20	73.90	89.36	17.67	6.82	29.22	91.29	85.48	95.28
Merwoe	65.38	38.84	89.47	70.79	61.35	80.84	17.39	11.60	24.10	89.14	83.05	94.71
El Daba	30.95	13.21	50.05	88.02	77.77	94.60	12.50	5.14	21.66	91.89	83.32	98.36
Halfa	69.88	55.78	82.19	76.01	70.66	82.48	20.00	13.10	28.17	82.78	75.36	90.28
Delgo	25.45	10.00	43.41	77.37	69.88	84.35	32.35	20.34	43.37	75.34	67.67	81.34
El Burgaig	52.50	35.28	69.15	80.11	73.15	87.14	12.44	6.56	18.84	85.78	78.54	91.95
Northern State	50.72	32.29	69.14	78.54	70.42	86.67	16.43	8.21	24.66	84.03	76.28	91.78
El Matama	36.47	22.64	54.12	78.88	70.94	85.85	20.86	14.65	27.95	79.17	70.72	87.00
Shendi	57.02	41.30	71.30	75.52	67.44	82.75	21.67	15.58	28.90	72.33	65.35	79.41

TABLE 18: ICFI component indicators by locality and state

Location	Exclusive Breast-feeding %			Continuing Breast-feeding %			Dietary Diversity %			Meal Frequency %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Hamad	44.44	23.53	64.88	76.63	70.38	82.63	4.23	0.73	8.45	60.94	51.69	70.62
Barbar	71.43	49.94	88.64	72.28	64.30	79.47	6.19	2.78	11.16	58.48	46.65	69.85
El Damar	42.68	30.93	53.85	79.13	74.72	83.20	43.53	34.63	53.01	86.55	80.60	91.84
Atbara	46.36	30.25	59.88	65.15	57.23	72.34	40.38	28.15	52.45	85.20	77.87	91.58
El Buhaira	46.50	36.66	56.18	84.35	78.96	89.31	22.77	17.93	28.42	81.94	73.85	88.32
River Nile State	49.36	33.75	64.97	75.47	68.74	82.20	25.16	17.66	32.65	75.48	67.05	83.91
Khartoum	47.06	21.86	70.37	73.05	65.24	80.52	39.43	29.91	48.67	77.15	66.66	85.01
Bahri	70.27	52.62	85.00	76.99	63.78	86.54	21.74	14.22	30.05	59.09	46.70	73.60
Um Durman	41.56	25.84	59.72	74.33	66.54	81.16	29.70	19.93	39.70	65.95	55.74	75.74
Um Bada	66.67	48.63	82.45	77.78	70.98	84.87	18.44	12.14	25.23	51.20	38.33	65.72
Jebel Awlia	40.62	17.78	66.67	76.28	66.83	84.04	16.26	8.81	26.15	68.44	57.14	79.72
Sharg Elneel	55.81	34.53	73.59	66.05	57.95	73.17	35.51	26.26	46.69	71.48	58.82	83.28
Karrari	58.75	41.41	75.39	81.35	75.40	87.81	40.08	31.59	47.41	68.05	60.24	77.14
Khartoum State	55.27	35.29	75.26	75.13	67.27	83.00	27.96	19.28	36.63	65.71	53.77	77.64
Greater Medani	56.32	41.29	70.98	75.82	68.28	82.29	29.88	21.81	37.55	65.40	58.52	71.89
Ganub Elgazira	70.89	56.94	83.60	64.32	55.54	71.88	29.13	19.65	39.44	74.68	64.65	85.48
El Hassahisa	59.26	44.86	74.63	69.41	60.89	78.00	30.20	21.98	37.93	59.74	50.15	68.61
El Kamlin	54.55	39.98	72.07	69.53	61.40	76.87	15.25	10.48	23.01	51.38	38.70	65.07
Sharg El Gezira	72.22	54.54	85.96	76.70	69.01	83.12	36.12	27.14	44.70	65.95	53.77	77.18
Um Elqura	82.05	65.37	96.56	70.28	63.04	78.13	27.46	19.74	35.35	61.64	52.36	70.37
El Manaqil	57.97	39.39	72.74	71.18	61.41	79.13	26.33	17.27	36.56	51.89	40.30	62.78
El Qurashi	37.10	21.68	56.73	68.81	62.14	75.83	28.99	21.35	36.97	73.48	64.73	81.17
Al-Gazeera State	59.58	42.79	76.38	70.73	62.57	78.89	28.25	19.53	36.97	62.32	51.62	73.01
Sennar	67.33	52.29	82.37	69.98	63.93	76.85	46.06	36.73	53.16	75.10	66.06	81.88
Sharg Sennar	77.50	62.21	89.02	66.58	56.21	75.93	10.53	5.83	16.40	40.00	30.79	49.57
Sinja	28.57	17.64	42.35	72.67	66.55	80.45	30.86	22.86	39.56	65.34	56.20	73.60
Abu Hujar	73.00	59.76	85.05	73.02	66.08	78.84	22.07	15.43	30.33	47.55	36.59	59.80
El Dali	58.73	38.70	76.72	77.13	70.52	83.67	34.49	23.67	45.60	45.13	37.75	52.84
Es Suki	43.28	25.90	59.55	70.56	59.91	78.33	44.16	33.56	55.82	61.62	53.35	69.26
Ed Dinder	65.06	43.39	80.53	79.32	72.95	85.67	43.48	28.09	60.47	62.50	54.72	70.42
Sennar State	59.99	44.92	75.07	71.72	64.09	79.35	34.13	23.41	44.86	59.20	50.27	68.13
Ed Damazine	83.33	73.75	91.31	72.55	66.57	78.33	26.12	17.88	35.89	80.63	71.17	88.44
El Tadamon	70.18	54.54	83.33	86.20	79.99	91.25	45.27	37.00	53.09	58.71	49.82	65.47
El Roseiris	71.84	59.84	81.08	76.63	69.01	83.08	18.98	14.66	23.80	62.00	54.97	69.07
Baw	54.17	34.09	74.42	73.25	64.67	80.45	3.91	1.63	7.28	50.60	40.32	61.63
Geisan	85.19	71.61	96.71	88.45	81.19	93.90	7.09	3.31	11.44	51.13	39.93	61.36
El Kurmuk	94.44	69.96	100.00	79.43	69.19	87.23	6.67	2.77	12.41	68.75	49.99	86.22

TABLE 18: ICFI component indicators by locality and state

Location	Exclusive Breast-feeding %			Continuing Breast-feeding %			Dietary Diversity %			Meal Frequency %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Wad El Mahi	65.96	50.00	81.64	76.14	69.38	84.34	20.74	15.61	26.11	57.23	47.75	65.72
Blue Nile State	75.09	60.65	89.53	77.37	70.57	84.18	18.60	12.42	24.78	63.64	53.33	73.96
Kosti	60.00	45.56	74.25	75.78	68.44	81.32	34.80	26.78	42.20	62.72	53.94	70.82
Guli	65.45	47.50	81.25	79.73	73.44	84.72	17.22	11.86	22.37	65.49	56.99	74.35
Tendalti	54.35	36.28	74.21	72.90	64.41	80.67	7.95	4.40	13.14	40.31	32.17	50.00
Es Salam	68.42	51.72	85.08	76.11	69.07	82.68	22.22	15.63	29.19	37.14	25.42	50.01
Rabak	58.24	43.11	73.34	72.32	64.86	78.36	28.23	20.63	37.71	67.45	57.91	76.33
El Jabalain	72.58	56.45	87.17	67.28	58.25	75.17	19.44	13.33	24.78	53.97	45.09	61.69
El Diwaim	43.18	28.19	59.58	65.81	56.40	74.85	44.97	37.58	53.37	21.32	6.83	38.49
Um Rimta	84.62	70.26	95.86	77.45	70.15	82.92	39.77	32.56	47.14	75.67	67.91	82.70
El Gitaina	28.57	0.00	77.05	62.75	53.56	71.83	40.94	32.44	49.59	72.69	60.93	82.54
White Nile State	56.33	32.20	80.47	71.21	63.92	78.51	31.24	23.60	38.88	54.68	43.59	65.77
Port Sudan	72.00	57.53	84.26	82.71	75.55	90.63	48.80	37.45	58.83	88.63	81.45	94.39
Swakin	72.73	54.53	86.22	84.87	79.02	90.29	14.17	10.07	19.76	35.92	27.31	45.01
El Gonob Welawlaib	74.00	50.00	92.11	58.82	50.29	66.67	18.15	13.33	23.75	84.54	76.68	91.18
Sinkat	65.91	46.34	84.02	78.37	72.26	84.50	7.21	3.35	12.31	43.67	35.08	50.73
Haya	34.62	0.00	61.56	54.09	34.68	73.30	1.99	0.00	5.70	50.00	27.51	69.16
Dordieb	65.62	49.15	78.42	70.47	63.94	76.63	20.09	13.32	26.90	51.18	39.89	61.35
Tokar	53.57	34.87	71.88	87.26	78.40	92.78	26.27	19.53	33.99	83.99	74.71	90.97
Agig	100.00	100.00	100.00	86.64	81.46	92.62	5.73	2.17	9.99	56.12	45.50	67.46
Gabaot Elma-aadin	45.16	22.21	76.58	58.77	44.42	71.02	26.44	12.31	41.87	82.50	74.63	90.27
Halaeeb (accessible parts)	83.33	20.00	100.00	67.19	40.56	82.24	21.28	8.82	31.17	79.17	67.85	89.83
Red Sea State	62.57	36.46	88.69	71.79	58.97	84.60	19.34	11.84	26.84	66.38	53.63	79.13
Kassala Town	82.22	68.00	94.38	88.00	82.11	93.16	45.40	37.99	53.42	65.51	58.32	73.98
Refi Kassla	81.12	62.77	92.94	77.19	72.06	83.35	15.67	10.94	20.26	67.33	53.40	78.85
Rural Western Kassala	27.13	16.67	37.05	58.29	48.79	67.66	19.95	14.44	27.06	65.93	53.59	76.24
New Halfa	67.32	54.44	78.42	75.38	67.36	82.01	28.36	18.98	37.78	46.09	35.69	55.76
Refi Nahr Atbara	92.31	82.52	98.87	80.58	71.83	86.44	39.15	27.24	50.74	76.10	65.38	85.78
Rural Khashm Elgirba	98.75	91.88	100.00	88.43	81.59	93.87	19.25	11.38	29.39	67.09	58.54	76.89
Rural Wad Elhilaiw	74.19	61.21	83.82	86.48	79.18	91.90	13.59	8.71	18.81	58.65	46.93	69.53
Rural Aroma	35.21	13.55	58.36	73.80	66.45	80.29	16.44	11.76	22.47	81.03	68.36	93.21
Refi North Delta	75.00	55.25	93.76	85.57	75.83	93.19	8.07	4.02	13.51	52.94	42.62	64.17

TABLE 18: ICFI component indicators by locality and state

Location	Exclusive Breast-feeding %			Continuing Breast-feeding %			Dietary Diversity %			Meal Frequency %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi Hamashkureib	66.67	48.61	86.05	96.48	93.21	98.99	39.07	29.57	47.56	73.90	64.51	83.06
Rural Telkok	73.21	61.36	85.47	78.49	72.01	84.35	11.97	6.85	17.36	54.51	39.92	67.07
Kassala State	72.82	58.68	86.96	82.37	75.74	89.01	26.74	18.84	34.64	63.94	53.06	74.82
Gedaref Town	66.32	47.61	82.88	73.85	65.33	81.67	32.11	22.55	42.72	69.57	57.82	79.03
Middle Geddaref	78.26	49.93	100.00	71.61	65.36	78.55	19.11	13.65	26.36	73.63	63.96	83.34
Elbutana	82.05	67.12	92.73	76.28	69.85	82.63	27.17	19.29	35.80	62.39	53.31	71.06
El Fashaga	72.97	50.00	89.81	64.40	56.68	71.97	9.21	5.28	13.70	77.17	64.88	87.16
El Rahad	59.42	44.44	77.47	66.56	56.41	76.37	16.85	10.43	23.31	81.29	71.03	90.25
Gala-a El Nahal	60.00	39.34	77.10	69.69	59.91	79.62	34.69	20.72	48.29	58.09	45.69	67.83
El Fao	45.24	25.62	65.89	70.37	62.31	78.50	13.14	8.54	17.46	69.75	58.91	78.09
El Qureisha	70.59	49.96	90.66	77.22	68.04	87.12	16.67	10.63	24.84	63.64	54.41	73.99
El Mafaza	74.14	54.55	93.55	74.83	67.08	82.13	8.41	4.26	12.38	51.60	38.95	64.43
Basunda	52.11	26.86	74.25	72.81	62.76	81.70	19.31	11.84	27.11	41.20	33.00	50.01
Western Galabat	63.41	45.44	82.61	79.24	72.47	85.42	19.50	13.27	26.35	59.72	50.66	69.31
Eastern Galabat	85.71	68.17	98.16	75.40	68.22	81.06	10.83	4.97	21.62	49.36	39.07	60.35
Al-Gadarif State	66.77	47.18	86.36	72.42	64.01	80.84	18.74	11.42	26.06	64.24	54.13	74.35
Sheikan	63.89	53.76	75.31	79.96	74.69	84.59	46.42	37.51	54.11	82.62	75.92	88.15
Um Rawaba	62.63	52.27	72.69	78.30	72.52	83.12	27.63	19.17	38.27	64.80	55.49	73.48
Um Dam Haj Ahmed	40.00	23.57	56.21	81.01	74.99	86.78	33.58	24.26	42.11	66.54	56.91	74.71
El Rahad	59.21	46.57	73.39	83.73	74.52	93.48	25.26	17.36	33.72	59.16	42.70	73.65
Bara	47.67	34.05	62.66	74.31	66.77	81.61	32.84	24.42	43.07	70.22	60.72	78.50
Gharb Bara	43.33	29.71	57.41	73.33	64.58	81.50	32.39	21.79	43.86	62.07	47.81	75.48
Soudari	51.43	37.94	63.41	75.20	68.29	81.21	22.39	14.97	31.13	55.38	44.98	64.35
Gebrat El Sheikh	42.67	29.76	57.48	86.35	79.97	91.43	38.34	27.80	48.35	61.48	52.34	69.97
North Kordofan State	55.45	50.80	60.47	78.39	76.14	80.62	33.92	30.40	37.22	68.21	64.64	71.90
Kadugli	71.61	56.22	81.03	80.38	74.03	85.61	21.19	15.68	26.83	68.10	55.75	80.15
Reif Shargi	42.05	24.28	58.34	82.10	75.39	87.81	16.05	10.38	23.77	51.00	38.72	62.86
Dilling	70.15	44.05	88.10	64.86	55.68	75.32	26.35	19.00	36.08	67.82	50.76	82.91
El Quoz	62.62	52.29	72.88	75.86	69.32	82.64	23.47	16.32	34.69	48.39	36.51	59.93
Habila	45.57	28.11	65.03	80.24	73.30	87.43	25.30	15.75	34.51	43.88	30.04	57.93
Abassiya	67.37	52.85	80.71	74.54	67.61	81.29	34.85	25.55	45.15	54.21	42.41	64.06
El Rashad	77.89	61.25	92.31	72.55	64.59	80.07	25.75	17.70	35.32	51.63	35.76	66.69
Abu Jubaiha	74.75	55.03	88.80	77.61	71.94	82.72	22.77	16.00	31.43	43.14	34.95	50.95
El Tadamon	54.39	39.27	70.09	79.26	73.31	85.19	27.24	19.16	35.87	62.32	50.15	73.92
Talodi	34.62	16.64	55.56	80.72	61.33	91.24	13.19	6.89	21.45	40.19	26.17	61.68

TABLE 18: ICFI component indicators by locality and state

Location	Exclusive Breast-feeding %			Continuing Breast-feeding %			Dietary Diversity %			Meal Frequency %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ghadeer	43.08	27.98	61.12	78.89	69.17	86.78	23.84	14.84	35.76	64.04	53.84	74.32
El Leri	52.31	36.83	67.88	78.75	73.08	84.31	22.32	17.06	28.58	54.66	46.31	63.04
Abu Karshola	68.24	55.52	79.60	77.34	68.75	84.47	24.47	16.84	35.70	36.36	24.45	49.09
Delami	68.29	51.89	83.35	73.75	60.34	85.81	14.29	7.38	23.34	64.88	49.02	77.98
South Kordofan State	63.39	47.54	79.24	76.12	68.28	83.96	24.78	16.21	33.35	52.43	40.28	64.59
Abu Zabad	61.39	50.00	74.53	70.87	62.79	79.16	19.24	12.77	26.03	61.49	52.79	71.83
ElKhiwai	68.48	52.70	81.83	60.82	53.42	68.08	34.73	27.13	42.34	49.84	41.72	61.01
Ghubaish	52.75	36.83	68.24	79.25	70.64	85.85	7.91	3.66	13.36	38.38	23.84	55.40
El Nuhud	64.41	52.51	76.21	77.94	73.31	82.88	19.32	13.54	26.52	47.03	39.35	55.56
El Idia	45.56	30.43	61.90	82.69	76.20	88.61	20.92	12.13	32.10	51.67	35.97	68.32
Wad Benda	53.54	36.13	69.93	65.33	58.02	73.02	34.29	25.47	43.03	56.27	47.17	66.05
Lagawa	65.71	50.82	77.48	73.60	65.56	83.15	36.31	29.43	43.32	54.46	41.28	66.67
Elsunut	59.14	41.46	73.63	67.95	59.24	76.44	19.38	13.00	28.07	65.19	56.22	72.39
Keilik	70.42	55.73	83.33	65.23	58.20	71.14	16.95	10.35	25.11	73.88	66.77	80.61
Es Salam	54.30	42.66	65.74	85.49	79.12	90.86	23.08	16.33	30.14	58.04	50.21	65.36
Babanusa	61.90	53.91	71.03	76.28	68.48	82.93	19.68	14.22	25.89	52.63	39.66	65.64
Abyei	80.70	66.03	91.69	72.83	65.97	78.99	14.79	9.76	20.49	52.43	34.54	71.12
El Dibab	70.00	37.50	100.00	63.83	52.67	76.81	15.22	6.99	23.62	66.67	57.46	75.57
El Meiram	42.86	0.00	100.00	59.22	49.00	67.66	22.00	12.37	33.35	60.33	45.35	76.98
West Kordofan State	59.65	40.55	78.76	73.01	65.35	80.66	21.18	13.41	28.95	54.18	42.25	66.12
El Fasher	81.99	73.58	89.21	78.48	73.85	82.66	16.73	12.15	22.34	52.14	45.03	60.06
Tawila	80.33	57.55	96.97	85.82	77.81	92.89	38.85	27.21	51.24	70.47	59.15	80.50
Melit	81.25	69.23	92.67	73.08	65.78	80.62	20.97	10.62	32.06	56.15	44.96	67.58
Um Kadada	69.49	58.10	80.04	76.52	71.24	82.70	11.11	7.27	16.51	63.60	58.21	68.73
Kebkabiya	43.48	27.08	62.77	87.64	82.46	91.79	21.08	15.74	27.52	64.75	52.24	79.02
Kutum	90.00	77.53	98.08	71.94	63.85	79.58	23.25	15.45	33.95	55.38	46.24	65.25
El Mahalha	82.09	70.49	92.86	77.84	68.14	89.03	10.18	3.18	18.39	31.34	20.42	43.49
Saraf Omra	46.67	25.82	65.31	70.00	60.37	79.53	15.00	6.99	24.04	50.17	30.66	69.90
El Serief	52.17	38.20	66.67	76.70	64.83	83.80	2.16	0.37	4.89	11.62	6.34	18.34
Dar Elsalam	70.18	52.08	83.35	81.00	72.86	87.70	22.97	14.35	33.51	71.79	60.78	80.95
Kelemando	73.44	58.32	86.36	72.38	64.42	79.60	36.11	27.35	44.28	72.17	61.95	81.03
El Tawisha	66.96	56.56	76.88	59.59	49.67	68.54	9.61	5.67	14.13	61.19	52.17	67.83
Um Baru	39.13	20.59	62.53	61.27	48.40	71.20	32.28	18.79	41.22	80.62	65.61	91.21
El Lait	55.56	37.20	73.48	55.70	46.07	64.75	14.72	8.93	22.01	40.83	31.84	49.79
ELkuma	82.35	50.00	100.00	74.11	56.31	87.51	12.35	3.95	22.73	18.37	10.37	30.23
El Tina	NA	NA	NA	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 18: ICFI component indicators by locality and state

Location	Exclusive Breast-feeding %			Continuing Breast-feeding %			Dietary Diversity %			Meal Frequency %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kernoi	60.18	40.82	79.01	81.77	75.37	88.10	26.74	20.51	32.57	64.17	53.37	72.20
North Darfur State	65.73	50.81	80.66	76.39	68.61	84.17	17.43	9.98	24.87	50.65	38.97	62.33
Nyala South	59.65	49.22	71.44	70.30	64.28	77.38	25.28	18.00	31.89	77.03	67.90	84.67
Nyala North	73.33	51.83	100.00	72.13	54.00	89.64	32.31	11.66	49.10	80.56	67.24	91.67
Es Salam	76.60	64.28	87.37	69.01	61.30	75.90	19.79	13.66	26.46	49.56	41.93	57.30
El Wihda	47.37	29.95	65.83	77.84	70.05	83.83	16.15	9.44	23.53	41.11	34.05	50.00
Mershing	75.91	57.67	88.89	68.68	62.69	74.70	35.94	28.49	41.90	50.72	43.81	57.16
Beliel	89.82	84.11	94.26	72.96	66.02	79.09	23.11	17.66	29.07	69.91	63.39	75.28
Nitega	65.00	47.47	83.61	62.73	52.84	73.09	18.06	11.84	25.23	59.83	50.69	68.89
Sharg El Jabal (accessible parts)	NA	NA	NA	80.00	40.00	100.00	16.67	0.00	66.67	100.00	100.00	100.00
Kas	56.06	40.22	71.78	64.99	57.93	71.65	36.62	29.06	43.83	59.39	53.14	66.03
Shattaya	38.24	20.88	56.76	61.31	55.12	68.19	65.67	56.83	74.35	65.97	58.89	73.45
Buram	65.62	50.59	79.19	57.43	48.53	64.78	42.64	33.65	53.34	79.74	73.97	84.46
Gereida	72.34	54.71	86.68	71.29	64.18	77.81	36.31	26.70	45.09	76.88	70.02	84.10
El Sunta	81.58	71.26	91.18	63.46	55.93	71.13	55.84	43.62	70.14	65.09	53.10	76.51
El Radoum	71.43	53.32	86.28	77.51	70.93	84.38	61.70	51.92	71.20	62.15	54.70	70.65
Tulus	84.38	56.81	100.00	65.14	51.61	75.28	11.76	1.87	23.53	66.11	50.00	76.55
Damso	90.00	62.42	100.00	78.12	69.57	85.56	21.30	10.49	38.10	65.41	51.26	77.11
Ed Elfursan	87.50	52.26	100.00	72.48	64.10	80.88	25.71	18.98	33.95	11.35	4.92	20.08
Kubum	30.61	16.66	50.51	56.90	51.46	63.16	9.20	4.83	15.45	52.16	45.56	58.72
Kateila	100.00	93.53	100.00	73.24	64.54	80.87	19.90	11.66	30.18	10.29	4.65	17.16
Rehaid Elbirdi	59.62	50.65	70.46	54.90	47.53	61.49	39.36	30.12	49.55	80.43	73.97	85.73
Um Dafoug	51.67	33.82	67.11	61.15	52.66	69.12	43.07	33.84	51.34	83.40	75.91	89.55
South Darfur State	69.95	50.63	89.28	67.24	57.37	77.12	29.97	19.52	40.42	61.69	52.86	70.52
Abu Jabra	83.33	61.82	96.83	65.20	58.84	72.16	8.49	4.19	14.34	49.27	37.84	60.77
Abu Karinka	81.58	62.78	94.13	55.38	47.15	63.76	1.81	0.00	5.46	24.44	16.36	34.94
Bahr El Arab	93.55	75.37	100.00	72.91	61.76	84.35	1.08	0.00	3.67	31.25	22.95	39.90
Adila	47.62	25.00	72.44	46.61	37.01	56.78	3.84	1.88	6.60	4.36	0.00	11.39
Ed Dain	87.06	73.58	97.15	76.14	68.31	83.10	22.81	16.24	30.72	70.14	58.84	79.30
Assalaya	86.29	78.57	92.70	66.67	59.28	74.43	4.23	0.64	8.84	71.71	64.13	78.49
El Firdous	60.00	27.24	92.92	84.38	78.79	89.11	9.21	5.22	14.22	77.88	68.88	86.15
Shia-ria	66.67	47.05	83.94	88.93	81.21	95.01	20.39	13.12	31.45	86.64	78.89	93.72
Yassin	91.95	84.26	98.68	67.61	60.05	74.16	4.78	1.81	8.08	40.59	29.68	50.59
East Darfur State	78.65	60.87	96.42	68.13	59.61	76.65	7.39	2.68	12.09	47.22	38.41	56.02

TABLE 18: ICFI component indicators by locality and state

Location	Exclusive Breast-feeding %			Continuing Breast-feeding %			Dietary Diversity %			Meal Frequency %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Geneina	81.02	71.88	88.96	73.45	66.79	79.85	28.51	19.21	38.78	77.87	69.78	84.54
Habila	75.61	54.38	93.35	69.76	60.31	78.16	9.56	4.68	15.32	51.42	43.57	61.58
Kulbus	90.43	82.61	96.51	62.79	52.88	75.11	21.39	11.20	34.70	56.46	40.81	71.70
Beida	66.67	36.83	90.20	76.59	68.78	83.29	23.96	17.47	30.50	81.99	75.16	88.03
Foro Baranga	79.17	58.33	93.75	61.41	52.18	71.43	13.02	7.79	18.36	67.93	50.30	83.85
Kereneik	81.05	73.16	88.41	75.86	70.71	80.24	15.11	9.53	21.70	47.81	41.49	55.03
Sirba	84.29	70.93	94.52	75.16	68.62	80.47	8.17	3.54	14.69	70.91	60.24	81.12
Jebel Moon	81.36	66.22	93.76	70.86	62.20	78.58	11.47	6.82	16.59	52.00	43.35	61.17
West Darfur State	81.01	67.98	94.03	71.05	62.94	79.16	19.08	11.14	27.01	65.83	55.67	75.98
Zalingi	76.15	65.72	84.52	70.98	66.06	75.81	8.42	5.18	12.49	69.04	63.50	74.56
Wadi Salih	60.00	32.53	92.87	68.25	61.56	75.42	25.89	19.89	33.33	60.58	51.58	69.27
Mukjar	55.00	19.03	85.36	53.53	43.47	62.54	19.10	13.70	25.27	82.50	73.76	89.84
Central Jebel Mara	85.71	58.31	100.00	85.54	68.10	95.79	21.52	11.11	34.49	53.68	38.37	69.24
North Jebel Mara	93.55	68.42	100.00	76.25	61.51	88.25	3.80	0.00	13.41	100.00	95.36	100.00
Bendasi	84.62	58.32	100.00	62.09	53.95	71.77	20.99	14.92	28.27	28.72	21.59	36.77
Nertiti	60.26	41.95	77.24	64.84	53.33	77.16	25.81	16.73	34.96	86.33	78.27	93.89
Azum	63.89	49.95	80.02	75.00	64.69	83.16	37.31	27.13	48.64	84.40	78.82	89.90
Um Dukhun	20.00	5.88	37.95	48.79	40.74	56.83	15.33	8.87	23.93	48.75	37.99	60.51
Central Darfur State	67.79	45.63	89.96	67.94	57.98	77.89	18.78	11.10	26.47	66.92	57.42	76.42
Sudan	62.36	44.02	80.70	73.50	65.27	81.73	25.12	16.76	33.49	62.16	51.49	72.84

ICFI score and good IYCF practices

The mean total ICFI score was 3.75 (95 per cent CI: 3.46-4.04) out of a maximum of 6 for all of Sudan. The number of children 6-23 months old who practiced good IYCF *(see Table 16)* was 12.7 percent (95 per cent CI: 6.8-18.6 per cent), while the number of children 0-23 months old who practiced good IYCF was 22.3 per cent (95 per cent CI:15.8-28.8 per cent). Based on the results of the ICFI component indicator, the main challenge with infant and young child feeding in Sudan was the low age-appropriate dietary diversity of children 6-23 months old.

Across the states, there was very little inter-state variability in all the ICFI summary indicators *(see Figure 70)*. Across the localities, there was more intra-state and inter-locality variance with the ICFI summary indicators *(see Figure 71)*. None of the localities had more than 50 percent of children aged 6-23 months and children aged 0-23 months who practiced good IYCF *(see Figure 71)*.

Table 19 and Table 20 present results per locality, per state and at the national level for estimates of mean ICFI score, good IYCF for children aged 6-23 months, and good IYCF for children aged 0-23 months.

FIGURE 70: Box plot of state results for ICFI summary indicators

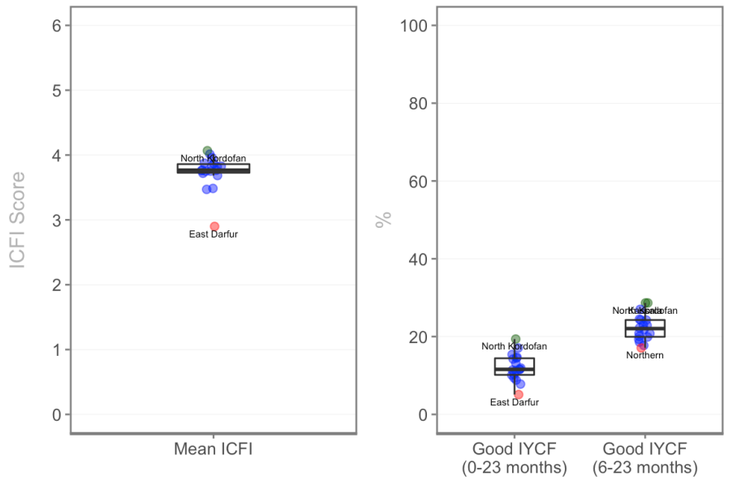


FIGURE 71: Box plot of locality results for ICFI summary indicators

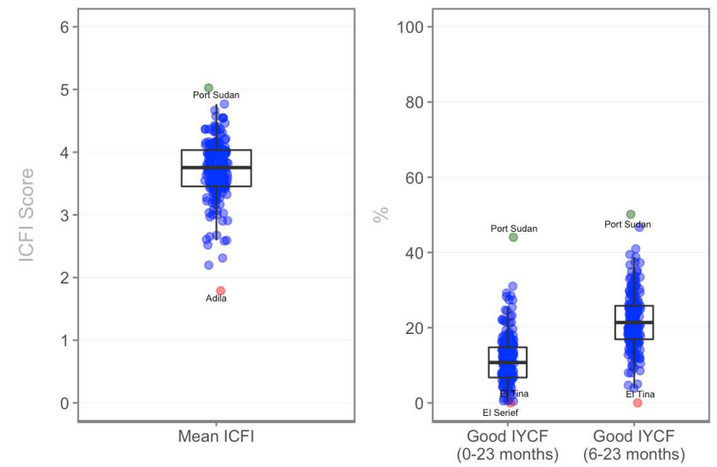


TABLE 19: ICFI summary indicators by locality and state

State	ICFI			Good IYCF (6 - 23months) %			Good IYCF (0 and 23 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	3.77	3.52	4.01	10.10	4.66	15.55	19.90	13.36	26.45
Al-Gazeera	3.83	3.52	4.14	14.49	7.96	21.02	24.28	17.78	30.78

TABLE 19: ICFI summary indicators by locality and state

State	ICFI			Good IYCF (6 - 23months) %			Good IYCF (0 and 23 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Blue Nile	3.76	3.50	4.02	11.60	6.17	17.03	22.87	16.80	28.95
Central Darfur	3.83	3.55	4.12	9.38	3.00	15.75	18.59	11.40	25.78
East Darfur	2.90	2.60	3.20	5.11	1.25	8.97	17.73	11.52	23.94
Kassala	4.01	3.76	4.27	17.07	10.28	23.85	28.66	21.58	35.74
Khartoum	3.87	3.59	4.16	13.12	7.53	18.70	20.07	13.81	26.34
North Darfur	3.47	3.16	3.79	8.83	4.04	13.62	20.85	15.19	26.50
North Kordofan	4.07	3.81	4.32	19.37	13.17	25.57	28.66	22.88	34.45
Northern	3.82	3.53	4.10	7.80	2.30	13.31	17.09	10.77	23.41
Red Sea	3.72	3.42	4.02	14.24	7.42	21.06	22.26	13.83	30.68
River Nile	3.96	3.70	4.21	14.72	8.88	20.57	21.86	16.24	27.49
Sennar	3.87	3.57	4.17	15.39	9.51	21.27	24.23	17.50	30.96
South Darfur	3.76	3.46	4.07	11.56	4.61	18.51	23.01	15.30	30.72
South Kordofan	3.68	3.37	4.00	11.27	5.32	17.23	24.48	17.78	31.19
West Darfur	3.75	3.46	4.04	11.39	5.84	16.94	27.00	20.83	33.17
West Kordofan	3.49	3.18	3.79	10.34	4.57	16.10	20.79	14.74	26.84
White Nile	3.75	3.48	4.02	11.92	6.57	17.26	19.31	13.60	25.02
Sudan	3.77	3.48	4.06	12.65	6.72	18.58	22.39	15.87	28.90

TABLE 20: ICFI summary indicators by state and national

Location	IYCF: Infant and child feeding index (ICFI)			Good IYCF (6 - 23months) %			Good IYCF (0 and 23 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	3.36	2.94	3.71	6.55	2.47	11.71	22.69	14.29	29.95
El Golid	4.00	3.75	4.23	7.97	2.23	14.91	15.56	10.12	21.37
Merwoe	3.93	3.78	4.11	6.94	2.38	11.66	15.56	9.37	22.58
El Daba	3.95	3.72	4.26	8.50	3.01	15.82	13.13	7.84	19.10
Halfa	4.28	4.09	4.47	13.98	8.08	20.36	28.44	22.47	34.11
Delgo	4.06	3.87	4.24	8.85	4.03	14.53	11.74	7.53	17.00
El Burgaig	3.72	3.43	3.97	7.83	2.61	12.97	17.06	11.20	23.14
Northern State	3.82	3.53	4.10	7.80	2.30	13.31	17.09	10.77	23.41
El Matama	3.95	3.73	4.14	8.57	4.76	13.44	15.15	10.58	21.16
Shendi	3.94	3.67	4.19	15.48	9.97	21.51	25.30	19.56	30.73
Abu Hamad	3.27	3.02	3.51	3.35	0.67	7.37	8.98	3.89	14.89

TABLE 20: ICFI summary indicators by state and national

Location	IYCF: Infant and child feeding index (ICFI)			Good IYCF (6 - 23months) %			Good IYCF (0 and 23 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Barbar	3.30	2.92	3.63	5.26	2.20	9.26	15.14	9.68	20.89
El Damar	4.48	4.23	4.71	26.27	19.76	32.90	29.27	22.99	35.45
Atbara	4.23	3.99	4.45	17.19	10.38	25.27	25.91	19.07	31.88
El Buhaira	4.31	4.07	4.52	18.54	13.52	23.03	24.61	19.70	29.92
River Nile State	3.96	3.70	4.21	14.72	8.88	20.57	21.86	16.24	27.49
Khartoum	4.08	3.84	4.27	19.05	14.08	25.68	23.00	16.84	29.40
Bahri	3.67	3.35	4.06	10.92	5.44	18.36	19.14	11.86	27.75
Um Durman	3.83	3.53	4.17	12.81	7.46	19.41	17.53	12.21	24.35
Um Bada	3.64	3.37	3.95	8.08	4.27	13.01	18.98	11.80	25.00
Jebel Awlia	3.64	3.39	3.88	6.88	2.14	11.90	12.02	7.98	16.60
Sharg Elneel	4.18	3.90	4.48	20.88	14.28	27.52	26.20	20.82	32.91
Karrari	4.17	3.94	4.42	16.19	10.26	23.38	24.86	18.01	32.86
Khartoum State	3.87	3.59	4.16	13.12	7.53	18.70	20.07	13.81	26.34
Greater Medani	3.89	3.63	4.16	15.57	10.00	21.24	24.71	19.17	30.26
Ganub Elgazira	4.00	3.65	4.36	17.24	9.11	26.58	31.25	23.68	38.97
El Hassahisa	3.82	3.59	4.06	14.77	9.75	19.72	25.07	19.55	30.38
El Kamlin	3.38	3.03	3.66	7.69	3.43	12.93	20.52	15.52	26.17
Sharg El Gezira	4.07	3.70	4.39	21.25	13.30	28.20	31.00	24.68	37.68
Um Elqura	3.69	3.41	3.95	12.93	7.14	19.78	21.52	14.88	28.68
El Manaqil	3.67	3.32	3.98	12.11	6.96	17.67	19.61	14.17	27.57
El Qurashi	4.07	3.76	4.36	16.50	10.98	22.79	20.64	15.28	27.27
Al-Gazeera State	3.83	3.52	4.14	14.49	7.96	21.02	24.28	17.78	30.78
Sennar	4.37	4.16	4.57	24.24	18.52	29.67	32.21	26.57	37.59
Sharg Sennar	3.03	2.66	3.36	7.80	3.92	11.60	20.59	14.50	27.31
Sinja	3.96	3.59	4.31	17.10	11.25	24.64	19.25	12.81	25.63
Abu Hujar	3.33	2.97	3.70	9.57	5.37	14.82	22.57	15.53	29.46
El Dali	3.77	3.53	4.00	8.57	4.98	12.31	17.01	11.99	22.51
Es Suki	4.14	3.84	4.39	19.00	12.45	24.93	23.60	18.28	29.79
Ed Dinder	4.16	3.95	4.35	12.00	6.45	19.25	24.29	14.84	35.00
Sennar State	3.87	3.57	4.17	15.39	9.51	21.27	24.23	17.50	30.96
Ed Damazine	4.22	3.96	4.51	18.87	11.40	27.63	33.40	26.98	40.14
El Tadamon	4.33	4.09	4.55	25.97	18.09	34.49	32.86	24.42	40.59
El Roseiris	3.73	3.53	3.94	10.17	6.40	15.01	24.49	20.69	30.35
Baw	3.07	2.80	3.35	3.81	1.28	6.47	12.24	8.39	17.28
Geisan	3.48	3.25	3.71	5.66	2.76	9.93	20.36	14.80	26.43
El Kurmuk	3.65	3.38	3.89	6.47	2.20	11.11	12.57	7.19	22.11
Wad El Mahi	3.63	3.30	3.87	9.86	6.17	13.92	17.34	13.44	21.64

TABLE 20: ICFI summary indicators by state and national

Location	IYCF: Infant and child feeding index (ICFI)			Good IYCF (6 - 23months) %			Good IYCF (0 and 23 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Blue Nile State	3.76	3.50	4.02	11.60	6.17	17.03	22.87	16.80	28.95
Kosti	4.05	3.82	4.24	14.21	9.64	20.34	22.11	16.24	28.15
Guli	3.61	3.27	3.93	12.54	8.28	17.38	21.56	16.34	27.92
Tendalti	2.53	2.15	2.94	4.80	2.08	8.77	12.40	7.84	17.15
Es Salam	3.46	3.25	3.70	5.93	2.12	11.07	19.09	12.87	24.87
Rabak	3.90	3.56	4.26	16.45	11.52	21.41	24.61	19.41	30.39
El Jabalain	3.52	3.28	3.78	9.80	6.08	15.20	21.13	16.39	26.48
El Diwaim	3.55	3.30	3.83	5.78	1.48	11.58	11.08	5.86	16.21
Um Rimta	4.41	4.23	4.66	21.79	16.13	28.85	31.27	25.08	38.42
El Gitaina	4.11	3.90	4.31	14.35	9.13	20.57	14.79	8.76	21.90
White Nile State	3.75	3.48	4.02	11.92	6.57	17.26	19.31	13.60	25.02
Port Sudan	4.84	4.56	5.10	38.00	27.18	47.91	48.02	39.66	55.67
Swakin	3.27	3.05	3.48	7.22	3.86	11.15	17.22	9.76	24.86
El Gonob Welawlaib	3.90	3.73	4.07	11.87	6.11	17.49	22.63	15.77	30.89
Sinkat	3.32	3.07	3.56	5.78	2.13	9.62	13.74	9.79	18.78
Haya	2.68	2.19	3.06	0.62	0.00	2.92	7.58	0.00	16.52
Dordieb	3.50	3.25	3.71	12.40	6.35	18.12	23.02	17.32	30.38
Tokar	4.45	4.21	4.65	19.23	12.57	26.25	25.95	18.90	32.51
Agig	3.38	3.14	3.57	3.86	1.42	6.71	4.20	1.48	7.49
Gabaot Elma-aadin	3.98	3.73	4.24	12.50	4.28	23.70	18.56	8.83	31.27
Halaeeb (accessible parts)	4.08	3.61	4.41	18.60	3.55	30.53	23.26	8.55	36.38
Red Sea State	3.72	3.42	4.02	14.24	7.42	21.06	22.26	13.83	30.68
Kassala Town	4.36	4.12	4.59	30.77	22.81	39.36	38.69	31.53	45.87
Refi Kassla	3.75	3.47	3.99	7.82	4.68	11.89	21.57	14.34	28.48
Rural Western Kassala	3.55	3.26	3.85	8.77	4.90	12.66	13.22	9.09	17.92
New Halfa	3.57	3.28	3.84	13.06	7.88	19.17	26.61	20.35	32.60
Refi Nahr Atbara	4.37	4.07	4.67	27.08	16.56	39.39	44.78	35.21	55.74
Rural Khashm Elgirba	4.16	4.01	4.34	12.55	7.31	19.67	34.94	27.69	42.27
Rural Wad Elhilaiw	3.71	3.46	3.99	12.00	7.94	16.25	27.07	22.05	31.39
Rural Aroma	4.19	3.97	4.42	11.19	6.83	16.42	15.38	10.16	21.68
Refi North Delta	3.57	3.33	3.83	7.55	3.32	12.17	28.01	19.99	36.51
Refi Hamashkureib	4.52	4.26	4.72	27.69	19.78	34.61	33.52	26.73	39.53
Rural Telkok	3.72	3.45	3.95	5.95	2.54	10.15	18.56	12.89	23.62
Kassala State	4.01	3.76	4.27	17.07	10.28	23.85	28.66	21.58	35.74
Gedaref Town	4.07	3.75	4.33	15.74	8.33	23.81	26.49	18.80	33.25

TABLE 20: ICFI summary indicators by state and national

Location	IYCF: Infant and child feeding index (ICFI)			Good IYCF (6 - 23months) %			Good IYCF (0 and 23 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Middle Geddaref	4.05	3.85	4.28	11.26	7.57	15.83	18.48	13.03	24.80
Elbutana	3.83	3.61	4.09	15.17	9.00	21.47	26.25	20.45	32.41
El Fashaga	3.97	3.79	4.17	7.19	3.85	10.52	15.41	9.53	22.04
El Rahad	3.99	3.74	4.27	10.71	6.63	15.22	20.56	15.42	26.49
Gala-a El Nahal	3.78	3.43	4.16	14.73	7.33	24.38	24.46	16.86	32.82
El Fao	3.60	3.39	3.80	8.91	5.41	12.69	15.70	10.46	22.23
El Qureisha	3.80	3.63	3.98	7.17	3.50	11.75	15.52	10.42	21.31
El Mafaza	3.35	3.13	3.56	5.56	1.77	9.49	16.84	11.24	22.29
Basunda	3.38	3.08	3.63	7.60	3.49	13.01	17.31	10.61	24.14
Western Galabat	3.84	3.66	4.01	10.63	6.78	15.63	21.41	15.16	28.53
Eastern Galabat	3.50	3.22	3.72	7.21	2.36	12.86	18.75	13.30	23.87
Al-Gadarif State	3.77	3.52	4.01	10.10	4.66	15.55	19.90	13.36	26.45
Sheikan	4.48	4.30	4.66	27.10	21.22	32.61	35.64	31.14	40.16
Um Rawaba	3.88	3.57	4.14	18.41	10.85	26.33	32.97	25.47	40.47
Um Dam Haj Ahmed	3.99	3.74	4.24	17.78	11.34	23.83	23.24	17.16	29.27
El Rahad	3.87	3.52	4.17	11.04	5.64	17.72	24.38	17.95	30.91
Bara	4.09	3.81	4.35	17.34	10.64	23.76	26.20	21.03	32.34
Gharb Bara	3.90	3.59	4.24	16.14	10.29	23.85	23.26	17.22	30.37
Soudari	3.71	3.50	3.94	13.32	8.46	18.07	22.20	16.83	27.48
Gebrat El Sheikh	4.10	3.81	4.40	20.82	12.80	27.94	26.07	19.73	31.97
North Kordofan State	4.07	3.81	4.32	19.37	13.17	25.57	28.66	22.88	34.45
Kadugli	3.94	3.64	4.24	14.39	10.07	19.56	29.06	23.08	35.27
Reif Shargi	3.52	3.18	3.82	12.81	7.81	18.84	21.02	15.09	27.01
Dilling	3.96	3.53	4.48	11.33	4.34	19.72	26.52	18.80	34.50
El Quoz	3.62	3.27	3.95	8.17	3.58	14.57	25.42	19.07	31.40
Habila	3.66	3.35	3.96	13.06	8.05	18.62	21.83	14.97	28.55
Abassiya	3.80	3.54	4.11	16.91	9.51	23.59	29.23	23.83	35.64
El Rashad	3.46	3.05	3.88	11.93	6.74	18.43	29.71	22.13	38.08
Abu Jubaiha	3.53	3.34	3.76	7.62	3.47	13.09	22.97	16.48	29.60
El Tadamon	3.78	3.52	4.02	15.61	10.40	20.56	24.68	18.37	31.42
Talodi	3.27	2.98	3.72	4.49	0.95	9.68	10.62	4.88	18.66
Ghadeer	3.94	3.70	4.15	9.34	4.64	15.97	16.03	10.97	22.08
El Leri	3.80	3.60	3.99	13.27	8.28	19.43	20.80	15.79	25.90
Abu Karshola	3.43	3.15	3.79	9.39	3.61	17.14	24.26	18.47	29.94
Delami	3.78	3.50	4.01	7.56	3.29	12.73	21.61	15.18	28.25
South Kordofan State	3.68	3.37	4.00	11.27	5.32	17.23	24.48	17.78	31.19
Abu Zabad	3.47	3.21	3.69	9.69	5.50	14.59	21.64	16.58	27.58

TABLE 20: ICFI summary indicators by state and national

Location	IYCF: Infant and child feeding index (ICFI)			Good IYCF (6 - 23months) %			Good IYCF (0 and 23 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
ElKhiwai	3.18	2.93	3.46	8.36	5.06	12.86	19.26	14.47	24.34
Ghubaish	3.25	2.90	3.64	5.14	2.26	8.31	16.62	12.46	21.42
El Nuhud	3.31	3.08	3.56	11.72	7.28	16.93	23.37	17.87	29.51
El Idia	3.55	3.08	4.05	14.68	4.50	26.82	21.49	14.87	30.19
Wad Benda	3.76	3.46	4.02	13.37	6.38	19.89	23.41	17.04	30.39
Lagawa	3.81	3.57	4.04	12.76	7.66	18.79	25.00	18.47	32.02
Elsunut	3.51	3.23	3.77	8.80	4.24	14.23	20.41	15.25	26.46
Keilik	4.00	3.82	4.17	3.73	0.76	7.73	16.24	12.54	20.24
Es Salam	3.70	3.51	3.91	7.82	4.97	12.12	18.76	14.75	23.02
Babanusa	3.43	3.15	3.71	10.12	4.95	15.55	25.91	20.67	30.82
Abyei	3.55	3.24	3.84	7.81	4.41	12.66	19.94	14.20	26.81
El Dibab	3.52	3.23	3.77	8.27	3.00	14.80	13.89	8.64	20.56
El Meiram	3.25	2.79	3.79	14.08	7.14	21.03	16.07	10.37	24.32
West Kordofan State	3.49	3.18	3.79	10.34	4.57	16.10	20.79	14.74	26.84
El Fasher	3.52	3.35	3.70	8.61	5.45	12.38	24.05	20.00	29.31
Tawila	4.10	3.79	4.44	20.63	13.13	27.78	30.03	22.73	38.31
Melit	3.59	3.27	3.98	12.90	6.40	20.87	29.89	22.65	36.82
Um Kadada	3.53	3.32	3.71	7.31	4.55	10.68	19.93	14.73	25.29
Kebkabiya	4.05	3.85	4.27	14.34	9.17	20.31	19.06	14.09	24.74
Kutum	3.63	3.31	3.92	12.64	7.62	18.98	29.46	23.82	34.87
El Mahalha	3.35	2.94	3.67	5.36	1.01	11.00	26.40	19.08	33.35
Saraf Omra	3.04	2.39	3.60	4.88	1.35	8.51	12.33	7.40	17.08
El Serief	2.39	2.09	2.65	1.74	0.33	4.13	12.60	8.78	17.15
Dar Elsalam	3.90	3.68	4.14	13.85	7.76	21.90	25.81	19.71	32.14
Kelemando	3.95	3.65	4.21	17.38	12.49	21.91	26.26	20.52	32.60
El Tawisha	3.32	2.91	3.62	3.95	1.25	6.76	22.32	16.80	28.67
Um Baru	4.13	3.75	4.41	11.46	6.32	19.31	17.62	10.99	25.82
El Lait	3.01	2.76	3.33	6.98	2.80	12.72	17.01	11.19	23.65
ELkuma	2.71	2.33	3.18	4.46	0.00	11.23	14.84	6.98	22.96
El Tina	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00
Kernoi	3.93	3.54	4.25	8.11	4.13	12.97	17.58	13.45	21.89
North Darfur State	3.47	3.16	3.79	8.83	4.04	13.62	20.85	15.19	26.50
Nyala South	4.09	3.80	4.36	13.92	9.19	20.21	27.23	21.49	34.13
Nyala North	4.47	3.83	4.94	17.65	7.40	31.90	34.44	24.34	48.50
Es Salam	3.46	3.26	3.65	7.60	3.26	12.26	23.18	17.92	28.22
El Wihda	3.26	3.02	3.52	5.73	2.13	10.77	13.39	8.44	19.62
Mershing	3.74	3.58	3.88	10.75	6.57	16.32	27.43	22.06	32.88

TABLE 20: ICFI summary indicators by state and national

Location	IYCF: Infant and child feeding index (ICFI)			Good IYCF (6 - 23months) %			Good IYCF (0 and 23 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Beliel	3.83	3.62	4.04	11.09	7.70	14.69	37.23	32.21	42.02
Nitega	3.53	3.29	3.73	8.37	3.97	12.85	19.80	12.35	28.23
Sharg El Jabal (accessible parts)	4.60	3.66	5.40	20.00	0.00	60.00	28.57	0.00	57.14
Kas	3.74	3.50	3.98	12.78	9.31	16.43	20.14	15.69	25.12
Shattaya	4.33	4.09	4.56	22.96	17.89	9.00	25.43	20.69	29.92
Buram	4.19	4.03	4.36	12.47	8.06	18.58	20.37	14.95	25.84
Gereida	4.36	4.05	4.61	24.39	16.41	32.82	32.03	25.87	39.33
El Sunta	4.11	3.89	4.32	11.06	5.73	17.08	30.48	25.00	37.14
El Radoum	4.20	3.90	4.47	22.58	16.36	29.41	31.95	26.48	38.42
Tulus	3.60	3.10	3.98	6.25	0.00	16.82	16.32	7.25	26.11
Damso	3.84	3.54	4.22	12.50	5.74	21.89	25.37	14.79	37.26
Ed Elfursan	2.59	2.32	2.91	2.12	0.00	5.60	7.99	3.54	14.55
Kubum	3.22	3.02	3.45	4.95	2.17	8.80	10.25	5.41	15.97
Kateila	2.62	2.30	2.92	1.32	0.00	5.51	14.00	8.16	21.02
Rehaid Elbirdi	4.07	3.84	4.24	15.62	10.79	20.60	29.15	23.80	34.23
Um Dafoug	4.11	3.83	4.33	16.36	10.48	22.35	24.04	17.73	30.95
South Darfur State	3.76	3.46	4.07	11.56	4.61	18.51	23.01	15.30	30.72
Abu Jabra	2.84	2.48	3.24	4.72	1.39	9.12	15.50	9.18	23.20
Abu Karinka	2.32	1.99	2.61	1.67	0.00	4.65	10.14	6.13	15.14
Bahr El Arab	2.21	1.96	2.45	0.56	0.00	2.78	19.75	13.74	26.86
Adila	1.81	1.54	2.13	0.58	0.00	2.61	5.07	2.50	7.75
Ed Dain	3.99	3.71	4.24	15.13	10.09	20.14	30.87	23.67	36.80
Assalaya	3.09	2.83	3.36	2.68	0.58	6.41	26.06	20.60	32.62
El Firdous	4.10	3.89	4.31	6.46	3.08	11.71	8.92	5.71	13.47
Shia-ria	4.28	3.99	4.59	18.72	10.17	30.78	26.28	17.69	36.30
Yassin	2.81	2.41	3.18	3.68	1.21	6.94	19.60	13.27	25.70
East Darfur State	2.90	2.60	3.20	5.11	1.25	8.97	17.73	11.52	23.94
El Geneina	4.21	3.92	4.43	18.47	12.23	26.12	33.75	28.08	40.67
Habila	3.20	2.84	3.52	4.10	0.86	7.84	16.62	11.11	23.18
Kulbus	3.51	3.09	3.91	8.73	3.02	17.02	35.42	27.14	43.34
Beida	4.09	3.92	4.24	13.18	8.79	18.03	17.29	12.17	21.99
Foro Baranga	3.60	3.19	3.97	5.77	2.84	8.84	17.97	12.12	24.45
Kereneik	3.37	3.13	3.63	10.11	6.45	14.71	25.10	20.31	30.60
Sirba	3.72	3.42	4.06	5.86	1.94	11.22	23.35	17.57	29.78
Jebel Moon	3.50	3.30	3.68	10.22	5.20	15.56	24.11	17.08	31.13
West Darfur State	3.75	3.46	4.04	11.39	5.84	16.94	27.00	20.83	33.17
Zalingi	3.58	3.42	3.76	6.50	4.03	10.10	19.53	15.65	24.45

TABLE 20: ICFI summary indicators by state and national

Location	IYCF: Infant and child feeding index (ICFI)			Good IYCF (6 - 23months) %			Good IYCF (0 and 23 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Wadi Salih	3.75	3.57	3.94	10.28	6.52	14.11	14.17	9.84	17.92
Mukjar	3.98	3.82	4.12	11.92	6.62	18.25	15.46	10.14	20.63
Central Jebel Mara	3.84	3.26	4.36	12.09	4.49	21.27	23.00	13.11	32.33
North Jebel Mara	4.71	4.52	4.93	3.90	0.00	12.68	20.48	10.20	31.05
Bendasi	2.85	2.54	3.15	4.26	1.59	8.64	17.37	10.71	25.12
Nertiti	4.27	3.86	4.67	19.77	12.49	27.73	29.71	21.29	38.70
Azum	4.31	4.10	4.55	13.78	7.14	22.01	25.86	18.28	34.99
Um Dukhun	3.33	3.06	3.60	8.47	2.76	17.68	10.16	4.59	18.99
Central Darfur State	3.83	3.55	4.12	9.38	3.00	15.75	18.59	11.40	25.78
Sudan	3.77	3.48	4.06	12.65	6.72	18.58	22.39	15.87	28.90

Spatial distribution of IYCF practices

High rates of exclusive breast-feeding were spread almost evenly throughout Sudan, with small pockets of low rates in Red Sea state and Northern state *(see Figure 72)*. Age-appropriate continuing breast-feeding followed the same spatial pattern as exclusive breast-feeding *(see Figure 74)*. Low age-appropriate dietary diversity was evenly spread through Sudan *(see Figure 76)*. High rates of age-appropriate meal frequency were evenly spread throughout Sudan, with small areas of low rates in Red Sea state, West Kordofan state, North Darfur state, East Darfur state and South Darfur state *(see Figure 78)*.

Moderate ICFI scores were evenly spread throughout Sudan *(see Figure 78)*. There was a near-even spatial spread of low rates of good IYCF for children 6-23 months and children 0-23 months *(see Figure 82 and Figure 84)*.

FIGURE 72:
IYCF Exclusive breast-feeding (raster)

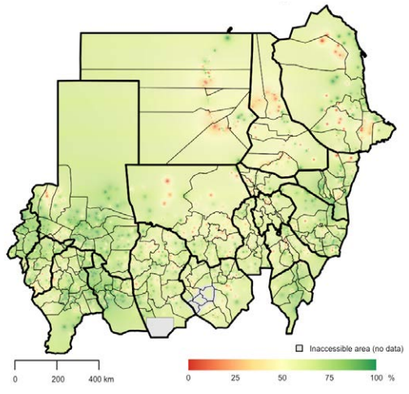


FIGURE 73:
IYCF: Exclusive breast-feeding

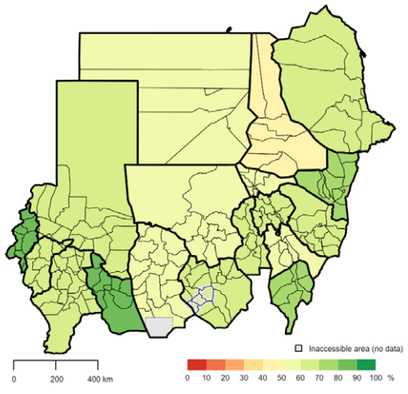


FIGURE 74:
IYCF: Age-appropriate continuing breast-feeding (raster)

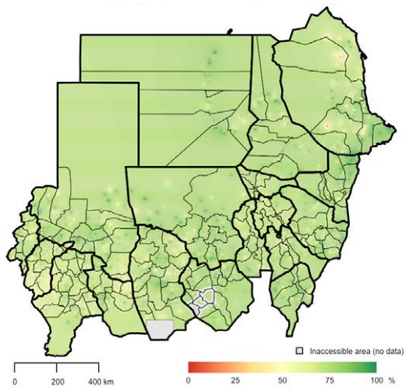


FIGURE 75:
IYCF: Age-appropriate continuing breast-feeding

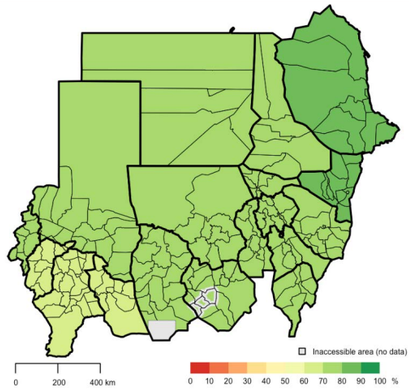


FIGURE 76:
IYCF: Age-appropriate dietary diversity (raster)

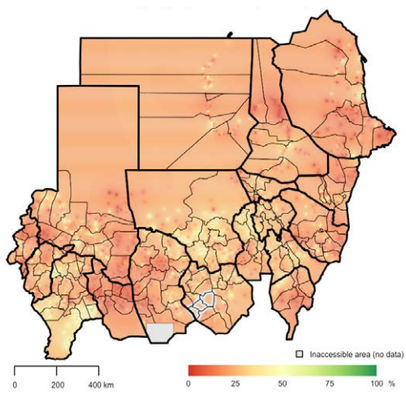


FIGURE 77:
IYCF: Age-appropriate dietary diversity

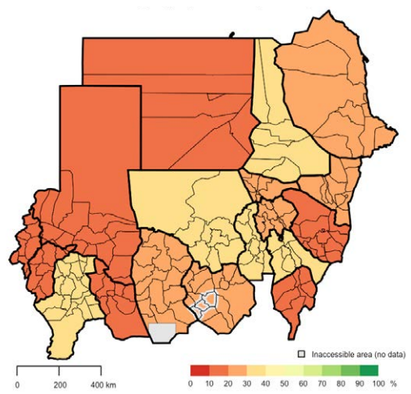


FIGURE 78:
IYCF: Age-appropriate meal frequency (raster)

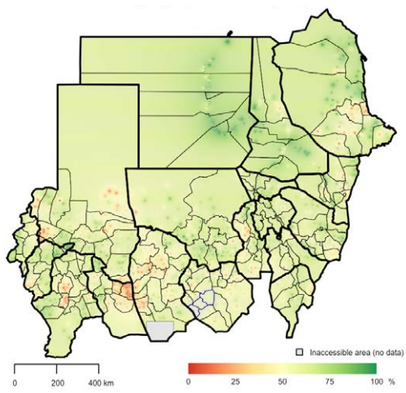


FIGURE 79:
IYCF: Age-appropriate meal frequency

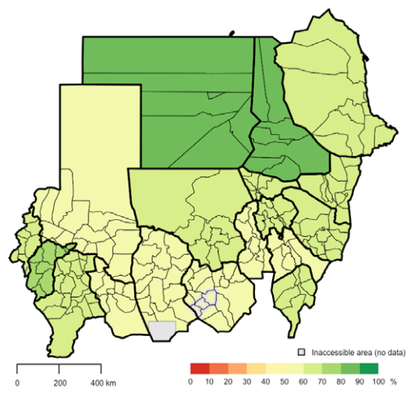


FIGURE 80:
IYCF: Infant and child feeding index (ICFI) (raster)

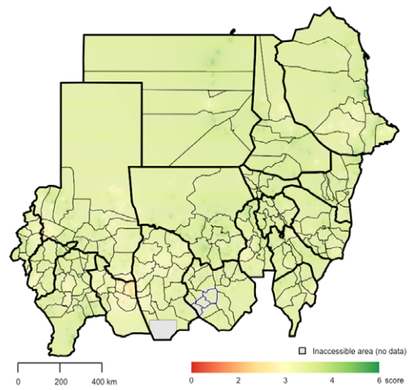


FIGURE 81:
IYCF: Infant and child feeding index (ICFI)

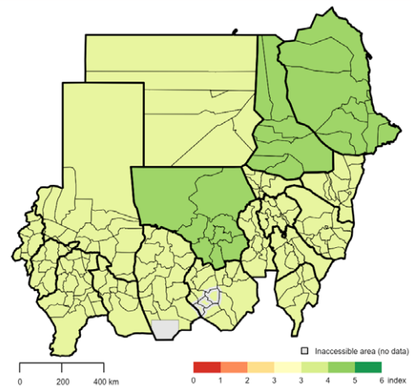


FIGURE 82:
IYCF: Good IYCF (children aged 6 – 23 months) (raster)

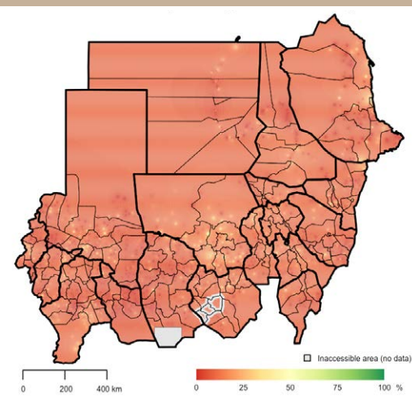


FIGURE 83:
IYCF: Good IYCF (children aged 6 – 23 months)

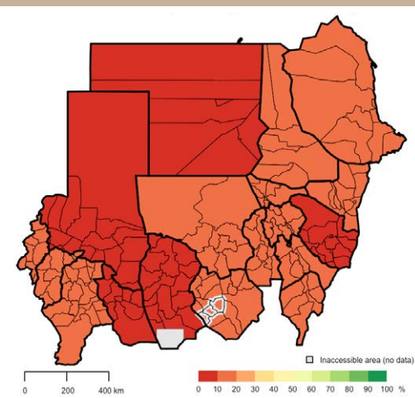


FIGURE 84:
IYCF: Good IYCF (children aged between 0 and 23 months) (raster)

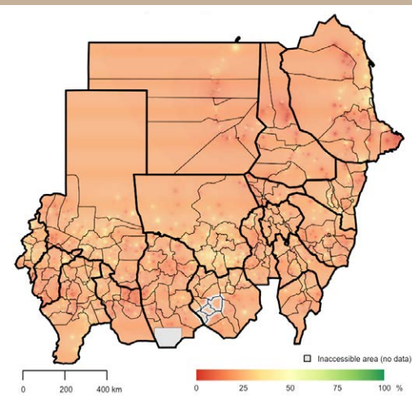
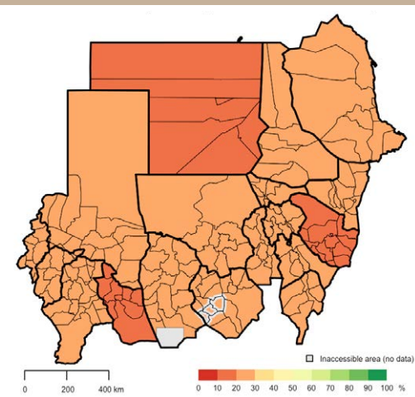


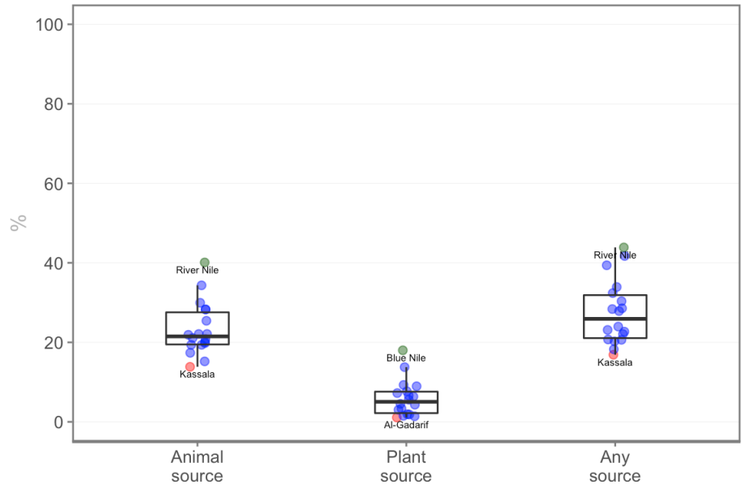
FIGURE 85:
IYCF: Good IYCF (children aged between 0 and 23 months)



3.3.2 Child consumption of protein-rich foods

Child consumption of protein-rich foods from any source was at 28.9 per cent (95 per cent CI: 1.73-56.0 per cent). Animal sources, rather than plant sources, constituted the majority of protein-rich foods consumed by children, with 24.4 per cent (95 per cent CI: 0.01-51.8 per cent) from animal sources compared to 6.7 per cent (95 per cent CI: 0.01-20.5 per cent) from plant sources. This pattern of protein-rich foods consumption mimicked that of carers- but at a much smaller proportion. The same pattern of consumption of protein-rich foods persisted at the state level, with low inter-state variability *(see Figure 86)*.

FIGURE 86: Box plot of state and locality results for child consumption of protein-rich foods



Child consumption of protein average results

The same pattern of protein-rich food consumption for children was found at the locality level, but with greater intra-state and inter-locality variability. About 82.7 per cent of localities had fewer than 50 per cent of children who consumed protein-rich foods from any source while 16.6 per cent of localities had no children who consumed protein-rich foods from any source. Animal source protein-rich foods were the main sources of protein for those children who consumed protein-rich foods in the localities *(see Figure 87)*.

Table 21 and Table 22 present results by locality, by state and at the national level for estimates of consumption of protein-rich foods from animal sources, plant sources and from any source.

FIGURE 87: Box plot of locality results for child protein consumption

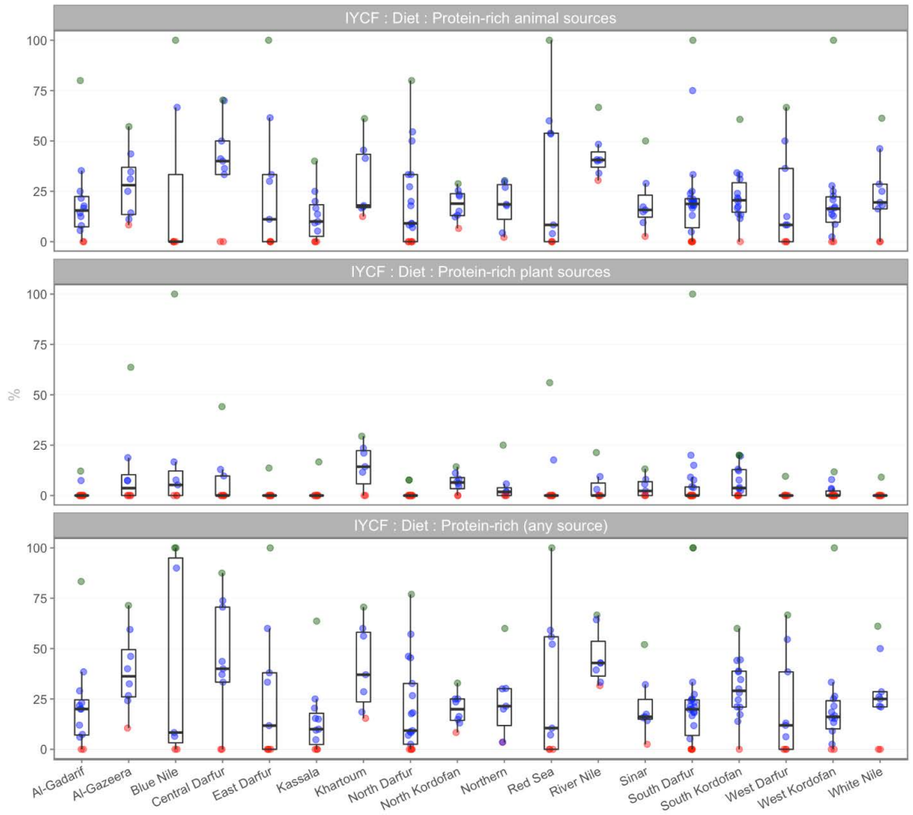


Table 21: Child consumption of protein-rich foods by state and national

State	Protein-rich animal sources %			Protein-rich plant sources %			Protein-rich (any source) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	19.37	0.01	45.35	1.11	0.01	8.62	20.65	0.01	48.55
Al-Gazeera	28.30	1.42	55.19	5.56	0.01	23.37	32.39	2.96	61.82
Blue Nile	15.21	0.01	32.97	18.01	0.01	36.75	33.92	14.38	53.45
Central Darfur	34.35	4.16	64.55	6.38	0.01	26.21	39.39	8.00	70.77
East Darfur	21.89	0.01	49.88	1.39	0.01	13.48	22.70	0.01	50.80
Kassala	13.85	0.01	40.37	1.85	0.01	15.63	16.89	0.01	43.94
Khartoum	29.96	2.90	57.01	13.77	0.01	31.80	41.72	16.39	67.05

Table 21: Child consumption of protein-rich foods by state and national

State	Protein-rich animal sources %			Protein-rich plant sources %			Protein-rich (any source) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
North Darfur	19.80	0.01	46.21	1.92	0.01	9.42	20.25	0.01	44.83
North Kordofan	20.05	4.63	35.48	7.71	0.01	17.20	22.10	6.95	37.25
Northern	20.85	0.01	48.80	7.25	0.01	27.82	28.37	2.99	53.75
Red Sea	19.37	0.01	39.00	4.54	0.01	20.41	20.72	0.01	42.72
River Nile	40.11	18.04	62.17	6.64	0.01	14.20	43.88	21.31	66.45
Sennar	21.10	0.01	42.96	4.32	0.01	15.09	23.95	1.74	46.16
South Darfur	28.27	0.01	74.11	9.28	1.58	16.98	28.57	0.01	69.90
South Kordofan	22.10	2.11	42.09	8.95	0.01	24.70	30.35	7.38	53.32
West Darfur	22.10	0.01	53.25	3.04	0.01	13.28	23.12	0.01	54.49
West Kordofan	17.37	0.01	40.14	1.52	0.01	8.47	18.26	0.01	42.31
White Nile	25.42	0.74	50.09	3.34	0.01	13.30	27.87	2.73	53.02
Sudan	24.36	0.01	51.79	6.66	0.01	20.49	28.85	1.73	55.98

Table 22: Child consumption of protein-rich foods by locality and by state

Location	Protein-rich animal sources %			Protein-rich plant sources %			Protein-rich (any source) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	37.29	17.21	63.64	4.88	0.00	17.66	36.84	14.79	64.45
El Golid	2.60	0.00	11.76	2.27	0.00	11.15	2.22	0.00	12.22
Merwoe	25.00	0.00	64.80	25.00	0.00	77.89	55.56	14.13	89.55
El Daba	3.45	0.00	22.22	0.00	0.00	0.00	3.33	0.00	22.87
Halfa	51.85	16.63	77.44	0.00	0.00	10.03	50.00	18.69	75.00
Delgo	15.22	2.16	36.68	7.89	0.00	25.00	20.69	4.64	45.85
El Burgaig	14.81	0.00	38.58	0.00	0.00	11.76	16.67	0.00	40.00
Northern State	20.85	0.01	48.80	7.25	0.01	27.82	28.37	2.99	53.75
El Matama	24.32	10.42	38.64	0.00	0.00	8.12	25.93	11.10	44.24
Shendi	33.87	17.14	51.44	0.00	0.00	0.00	33.93	18.39	52.55
Abu Hamad	35.00	6.67	67.86	0.00	0.00	0.00	35.00	6.23	68.19
Barbar	62.50	22.85	100.00	0.00	0.00	0.00	64.29	29.83	100.00
El Damar	45.45	31.24	61.18	19.48	8.74	32.50	59.35	43.89	73.75
Atbara	35.38	19.62	55.01	15.91	1.56	29.90	39.34	23.41	54.01

Location	Protein-rich animal sources %			Protein-rich plant sources %			Protein-rich (any source) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Buhaira	36.76	20.00	61.92	2.50	0.00	9.68	39.74	22.37	58.12
River Nile State	40.11	18.04	62.17	6.64	0.01	14.20	43.88	21.31	66.45
Khartoum	41.03	14.99	68.44	10.53	0.00	32.07	50.00	25.00	78.28
Bahri	16.67	0.00	50.00	0.00	0.00	20.00	17.86	0.00	53.44
Um Durman	58.33	32.07	81.26	20.00	5.69	36.37	58.33	30.77	81.10
Um Bada	50.00	25.77	75.03	22.50	4.17	52.38	73.68	42.84	96.16
Jebel Awlia	15.38	0.00	41.26	0.00	0.00	12.50	15.15	0.00	43.53
Sharg Elneel	12.50	0.00	34.78	23.08	3.65	46.71	37.04	12.48	61.56
Karrari	26.32	2.38	60.20	17.65	0.00	40.95	38.46	10.52	65.29
Khartoum State	29.96	2.90	57.01	13.77	0.01	31.80	41.72	16.39	67.05
Greater Medani	30.30	7.86	55.77	7.41	0.00	25.04	38.89	14.71	64.29
Ganub Elgazira	27.59	7.31	61.90	0.00	0.00	6.94	26.92	5.40	57.92
El Hassahisa	30.23	8.32	62.87	2.63	0.00	16.30	37.14	10.52	65.38
El Kamlin	11.11	0.00	29.04	0.00	0.00	0.00	11.76	0.00	27.87
Sharg El Gezira	8.00	0.00	35.71	19.05	0.00	50.00	25.00	3.28	57.92
Um Elqura	40.00	0.00	100.00	22.22	0.00	90.56	45.45	0.00	100.00
El Manaqil	39.53	15.78	68.48	0.00	0.00	15.01	42.11	17.09	68.44
El Qurashi	30.77	12.20	50.00	7.50	0.00	26.10	33.33	14.96	51.31
Al-Gazeera State	28.30	1.42	55.19	5.56	0.01	23.37	32.39	2.96	61.82
Sennar	22.58	0.00	44.70	7.69	0.00	26.10	29.17	4.73	54.89
Sharg Sennar	47.06	16.67	81.82	0.00	0.00	17.52	50.00	16.67	83.33
Sinja	9.88	3.23	18.47	5.88	0.00	13.24	15.12	6.45	25.02
Abu Hujar	19.51	0.00	44.44	9.52	0.00	36.39	20.59	0.00	48.24
El Dali	17.86	0.00	42.96	0.00	0.00	14.31	18.52	0.00	46.46
Es Suki	12.50	0.00	34.38	6.82	0.00	21.88	11.63	0.00	37.12
Ed Dinder	9.09	0.00	25.72	0.00	0.00	0.00	10.34	0.00	27.79
Sennar State	21.10	0.01	42.96	4.32	0.01	15.09	23.95	1.74	46.16
Ed Damazine	0.00	0.00	17.67	11.11	0.00	41.67	13.64	0.00	43.78
El Tadamon	100.00	100.00	100.00	0.00	0.00	0.00	100.00	100.00	100.00
El Roseiris	3.57	0.00	16.69	8.33	0.00	22.26	10.64	0.00	25.58
Baw	0.00	0.00	18.18	0.00	0.00	0.00	0.00	0.00	15.02
Geisan	63.96	9.25	100.00	14.29	0.00	62.63	85.71	33.33	100.00
El Kurmuk	0.00	0.00	0.00	100.00	0.00	100.00	100.00	0.00	100.00

Table 22: Child consumption of protein-rich foods by locality and by state

Location	Protein-rich animal sources %			Protein-rich plant sources %			Protein-rich (any source) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Wad El Mahi	0.00	0.00	0.00	6.67	0.00	30.00	5.88	0.00	27.78
Blue Nile State	15.21	0.01	32.97	18.01	0.01	36.75	33.92	14.38	53.45
Kosti	20.59	3.84	38.29	10.81	0.00	30.06	23.53	5.87	44.02
Guli	27.78	6.23	58.84	0.00	0.00	0.00	27.78	0.00	61.18
Tendalti	25.00	0.00	60.00	0.00	0.00	0.00	24.00	0.00	56.69
Es Salam	0.00	0.00	10.56	0.00	0.00	0.00	0.00	0.00	13.07
Rabak	24.00	0.00	43.41	0.00	0.00	14.29	25.00	3.09	47.40
El Jabalain	15.38	0.00	50.00	10.00	0.00	37.55	26.92	0.00	66.67
El Diwaim	58.06	34.24	80.97	0.00	0.00	0.00	58.97	29.96	82.07
Um Rimta	NA	NA	NA	0.00	0.00	33.33	NA	NA	NA
El Gitaina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White Nile State	25.42	0.74	50.09	3.34	0.01	13.30	27.87	2.73	53.02
Port Sudan	35.29	12.45	65.52	0.00	0.00	20.03	34.78	9.97	64.13
Swakin	0.00	0.00	9.26	0.00	0.00	0.00	0.00	0.00	6.25
El Gonob Welawlaib	100.00	77.64	100.00	33.33	0.00	100.00	100.00	75.00	100.00
Sinkat	0.00	0.00	40.00	5.00	0.00	30.90	14.29	0.00	50.17
Haya	8.33	0.00	30.79	0.00	0.00	0.00	7.14	0.00	29.21
Dordieb	60.00	33.25	86.67	16.00	0.00	46.67	60.00	33.28	84.39
Tokar	0.00	0.00	16.28	0.00	0.00	0.00	1.72	0.00	16.01
Agig	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gabaot Elma-aadin	54.55	19.82	81.31	55.00	18.72	83.33	55.56	25.00	85.05
Halaeeb (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red Sea State	19.37	0.01	39.00	4.54	0.01	20.41	20.72	0.01	42.72
Kassala Town	0.00	0.00	36.73	0.00	0.00	0.00	0.00	0.00	33.33
Refi Kassla	14.29	0.00	45.49	0.00	0.00	23.10	15.38	0.00	45.49
Rural Western Kassala	21.05	12.34	32.66	0.00	0.00	0.00	20.25	11.10	32.12
New Halfa	13.51	0.00	30.03	0.00	0.00	10.71	14.29	2.13	40.79
Refi Nahr Atbara	25.00	0.00	100.00	0.00	0.00	0.00	25.00	0.00	100.00
Rural Khashm Elgirba	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	100.00
Rural Wad Elhilaiw	4.35	0.00	18.20	0.00	0.00	0.00	5.26	0.00	21.53
Rural Aroma	17.31	5.39	34.31	0.00	0.00	0.00	17.86	4.52	34.24

Table 22: Child consumption of protein-rich foods by locality and by state

Location	Protein-rich animal sources %			Protein-rich plant sources %			Protein-rich (any source) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi North Delta	9.34	0.00	31.25	0.00	0.00	0.00	9.09	0.00	25.03
Refi Hamashkureib	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	14.68
Rural Telkok	42.86	7.69	87.57	8.70	0.00	44.44	61.11	18.65	100.00
Kassala State	13.85	0.01	40.37	1.85	0.01	15.63	16.89	0.01	43.94
Gedaref Town	9.26	0.00	32.31	4.35	0.00	22.25	11.11	0.00	37.53
Middle Geddaref	20.00	0.00	100.00	0.00	0.00	0.00	20.00	0.00	100.00
Elbutana	38.46	5.28	76.97	0.00	0.00	0.00	40.00	0.00	77.89
El Fashaga	5.88	0.00	38.70	0.00	0.00	0.00	5.88	0.00	35.40
El Rahad	12.12	0.00	36.38	0.00	0.00	0.00	12.12	0.00	38.11
Gala-a El Nahal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
El Fao	16.67	4.54	30.80	0.00	0.00	4.77	16.67	4.74	30.46
El Qureisha	0.00	0.00	42.90	0.00	0.00	0.00	0.00	0.00	40.06
El Mafaza	12.50	0.00	48.00	5.26	0.00	25.00	22.22	0.00	60.12
Basunda	10.26	0.00	27.34	0.00	0.00	0.00	10.34	0.00	29.76
Western Galabat	17.86	0.00	36.02	0.00	0.00	18.44	20.51	3.39	40.00
Eastern Galabat	83.33	33.33	100.00	0.00	0.00	33.33	80.00	24.38	100.00
Al-Gadarif State	19.37	0.01	45.35	1.11	0.01	8.62	20.65	0.01	48.55
Sheikan	27.54	14.53	44.34	12.12	3.57	23.37	28.92	15.54	42.65
Um Rawaba	7.45	1.18	15.65	5.63	0.00	12.16	9.38	2.27	19.44
Um Dam Haj Ahmed	27.08	11.76	43.91	13.64	2.08	28.59	34.69	14.53	55.12
El Rahad	14.81	0.00	35.18	0.00	0.00	11.16	14.29	0.00	34.81
Bara	23.53	10.63	39.00	11.43	2.13	24.01	22.45	9.52	39.68
Gharb Bara	22.95	8.33	42.87	6.00	0.00	16.30	23.64	7.98	43.76
Soudari	18.75	3.89	37.51	8.33	0.00	20.86	20.51	7.69	37.50
Gebrat El Sheikh	18.33	5.12	35.73	0.00	0.00	0.00	18.75	6.51	34.60
North Kordofan State	20.05	4.63	35.48	7.71	0.01	17.20	22.10	6.95	37.25
Kadugli	30.95	12.24	53.14	23.08	5.85	40.63	43.75	28.12	63.00
Reif Shargi	12.28	0.00	27.91	12.73	1.96	25.87	24.59	2.43	49.12
Dilling	11.76	0.00	44.44	30.77	0.00	63.64	36.36	0.00	72.84
El Quoz	27.27	12.50	45.00	0.00	0.00	10.35	28.30	12.24	48.79
Habila	30.36	15.38	45.46	0.00	0.00	6.47	30.65	18.02	46.02
Abassiya	21.43	4.64	45.49	3.57	0.00	18.93	26.67	8.70	53.33

Table 22: Child consumption of protein-rich foods by locality and by state

Location	Protein-rich animal sources %			Protein-rich plant sources %			Protein-rich (any source) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Rashad	20.83	0.00	52.69	20.83	0.00	50.00	36.84	11.75	64.80
Abu Jubaiha	11.43	0.00	38.48	10.00	0.00	33.47	23.81	4.16	62.56
El Tadamon	13.85	2.63	28.95	0.00	0.00	0.00	13.79	2.56	26.85
Talodi	20.00	5.88	50.00	0.00	0.00	0.00	21.05	4.32	50.00
Ghadeer	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	13.94
El Leri	13.64	1.32	30.96	2.44	0.00	13.94	15.38	3.57	32.26
Abu Karshola	55.56	26.87	88.46	0.00	0.00	12.91	59.26	30.71	92.02
Delami	16.67	0.00	47.21	11.54	0.00	35.32	30.77	7.66	61.54
South Kordofan State	22.10	2.11	42.09	8.95	0.01	24.70	30.35	7.38	53.32
Abu Zabad	18.60	3.57	39.04	0.00	0.00	0.00	17.24	2.86	40.06
ElKhiwai	27.59	0.00	60.04	0.00	0.00	0.00	26.92	0.00	60.06
Ghubaish	13.79	3.32	26.86	0.00	0.00	0.00	13.95	4.64	26.09
El Nuhud	14.55	3.57	30.34	0.00	0.00	6.83	14.29	2.77	28.89
El Idia	12.28	0.00	31.04	0.00	0.00	5.37	13.73	0.00	32.50
Wad Benda	15.79	4.16	36.45	3.03	0.00	13.25	19.05	4.55	42.88
Lagawa	21.74	4.55	52.21	11.76	0.00	34.49	36.36	12.43	61.13
Elsunut	28.57	8.81	53.88	8.33	0.00	28.61	28.12	10.81	51.85
Keilik	0.00	0.00	20.05	0.00	0.00	0.00	0.00	0.00	17.65
Es Salam	23.53	10.00	41.69	2.78	0.00	10.00	26.15	11.30	47.83
Babanusa	10.00	0.00	28.59	0.00	0.00	0.00	8.82	0.00	27.29
Abyei	17.65	0.00	66.67	0.00	0.00	0.00	18.18	0.00	54.60
El Dibab	40.00	0.00	100.00	0.00	0.00	0.00	42.86	0.00	100.00
El Meiram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
West Kordofan State	17.37	0.01	40.14	1.52	0.01	8.47	18.26	0.01	42.31
El Fasher	16.98	0.00	41.39	5.00	0.00	19.19	15.79	0.00	37.95
Tawila	22.22	0.00	66.67	0.00	0.00	0.00	20.00	0.00	67.26
Melit	33.33	6.23	64.29	6.67	0.00	30.00	41.18	8.30	76.94
Um Kadada	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	15.38
Kebkabiya	9.09	0.00	27.47	0.00	0.00	0.00	10.34	0.00	26.83
Kutum	50.00	0.00	100.00	0.00	0.00	0.00	50.00	0.00	100.00
El Mahalha	44.72	0.00	83.51	0.00	0.00	0.00	47.83	0.00	87.50
Saraf Omra	16.00	0.00	38.47	6.90	0.00	21.05	15.79	0.00	37.52

Table 22: Child consumption of protein-rich foods by locality and by state

Location	Protein-rich animal sources %			Protein-rich plant sources %			Protein-rich (any source) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Serief	6.38	0.00	20.04	0.00	0.00	0.00	5.71	0.00	20.69
Dar Elsalam	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kelemando	23.53	0.00	58.36	0.00	0.00	0.00	23.53	0.00	58.42
El Tawisha	8.51	0.00	21.65	0.00	0.00	0.00	9.09	0.00	22.51
Um Baru	65.22	21.00	100.00	0.00	0.00	0.00	66.67	21.43	96.92
El Lait	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ELkuma	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	100.00
El Tina	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kernoi	32.26	13.61	53.67	0.00	0.00	0.00	32.79	14.81	54.85
North Darfur State	19.80	0.01	46.21	1.92	0.01	9.42	20.25	0.01	44.83
Nyala South	17.39	6.24	32.70	2.33	0.00	10.72	17.86	4.53	33.39
Nyala North	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Es Salam	0.00	0.00	15.16	0.00	0.00	0.00	0.00	0.00	17.24
El Wihda	0.00	0.00	13.41	0.00	0.00	0.00	0.00	0.00	16.67
Mershing	17.39	0.00	37.96	0.00	0.00	0.00	18.52	2.07	40.03
Beliel	22.73	3.85	50.00	15.00	0.00	43.76	22.22	0.00	50.11
Nitega	11.11	0.00	33.33	0.00	0.00	0.00	11.76	0.00	32.07
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	5.26	0.00	18.19	0.00	0.00	3.23	5.13	0.00	20.71
Shattaya	23.40	6.24	42.38	4.65	0.00	17.88	22.92	6.24	41.46
Buram	16.00	0.00	39.29	8.00	0.00	26.71	26.67	0.00	56.55
Gereida	22.22	0.00	58.42	0.00	0.00	0.00	20.00	0.00	58.35
El Sunta	52.94	10.50	88.89	0.00	0.00	13.67	50.00	9.09	90.91
El Radoum	18.18	0.00	41.69	12.90	0.00	42.86	30.00	4.76	63.01
Tulus	75.00	0.00	100.00	0.00	0.00	0.00	75.00	0.00	100.00
Damso	25.00	0.00	100.00	0.00	0.00	0.00	25.00	0.00	100.00
Ed Elfursan	100.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Kubum	20.00	8.69	32.86	0.00	0.00	0.00	20.00	9.57	31.59
Kateila	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rehaid Elbirdi	24.00	8.92	38.31	0.00	0.00	0.00	24.29	10.38	37.74
Um Dafoug	18.92	3.98	39.17	0.00	0.00	0.00	17.24	3.33	36.39
South Darfur State	28.27	0.01	74.11	9.28	1.58	16.98	28.57	0.01	69.90

Table 22: Child consumption of protein-rich foods by locality and by state

Location	Protein-rich animal sources %			Protein-rich plant sources %			Protein-rich (any source) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Jabra	33.33	0.00	73.46	0.00	0.00	0.00	33.33	0.00	78.11
Abu Karinka	8.33	0.00	66.67	0.00	0.00	0.00	9.09	0.00	66.67
Bahr El Arab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adila	30.77	8.30	62.50	0.00	0.00	0.00	30.43	6.42	66.67
Ed Dain	31.25	0.00	75.14	14.29	0.00	60.00	30.00	0.00	83.33
Assalaya	11.76	0.00	43.78	0.00	0.00	0.00	11.76	0.00	41.67
El Firdous	100.00	100.00	100.00	0.00	0.00	0.00	100.00	100.00	100.00
Shia-ria	0.00	0.00	33.45	0.00	0.00	0.00	0.00	0.00	37.55
Yassin	0.00	0.00	57.57	0.00	0.00	0.00	0.00	0.00	66.67
East Darfur State	21.89	0.01	49.88	1.39	0.01	13.48	22.70	0.01	50.80
El Geneina	11.54	0.00	38.48	10.00	0.00	31.30	13.79	0.00	38.11
Habila	5.26	0.00	50.00	0.00	0.00	0.00	5.88	0.00	50.00
Kulbus	30.77	0.00	83.45	0.00	0.00	0.00	33.33	0.00	80.17
Beida	63.64	14.29	100.00	0.00	0.00	0.00	61.54	14.29	100.00
Foro Baranga	15.00	0.00	46.20	0.00	0.00	0.00	14.29	0.00	44.53
Kereneik	3.85	0.00	17.10	2.86	0.00	17.90	3.85	0.00	16.67
Sirba	39.13	12.41	87.50	0.00	0.00	24.05	42.11	9.95	80.00
Jebel Moon	25.00	0.00	75.00	0.00	0.00	41.73	25.00	0.00	66.67
West Darfur State	22.10	0.01	53.25	3.04	0.01	13.28	23.12	0.01	54.49
Zalingi	40.00	17.30	63.65	0.00	0.00	0.00	40.54	17.62	65.23
Wadi Salih	33.33	0.00	88.89	0.00	0.00	0.00	36.36	0.00	77.84
Mukjar	69.23	19.67	100.00	11.11	0.00	71.79	66.67	25.00	100.00
Central Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bendasi	NA	NA	NA	0.00	0.00	0.00	NA	NA	NA
Nertiti	60.00	32.09	82.95	7.55	0.00	25.03	66.67	33.27	87.52
Azum	38.89	14.24	64.33	0.00	0.00	0.00	38.46	15.99	62.56
Um Dukhun	45.16	14.29	82.62	38.24	4.98	74.07	87.50	59.09	100.00
Central Darfur State	34.35	4.16	64.55	6.38	0.01	26.21	39.39	8.00	70.77

Spatial distribution of child protein consumption

Low rates of protein-rich foods consumption from any source, animal sources and plant sources are evenly spread throughout Sudan, with pockets of high consumption rates in parts of Red Sea state, Blue Nile state and Darfur states *(see Figure 88, Figure 90 and Figure 92).*

FIGURE 88:
IYCF: Diet: Protein-rich animal sources (raster)

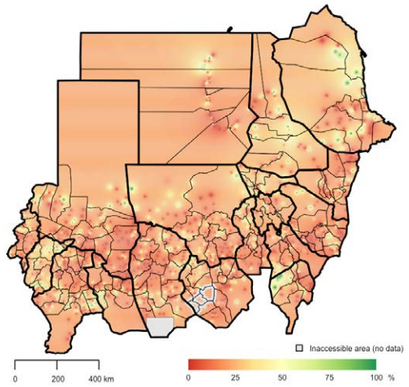


FIGURE 89:
IYCF: Diet: Protein-rich animal sources

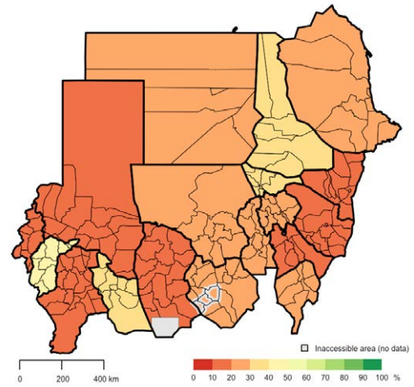


FIGURE 90:
IYCF: Diet: Protein-rich plant sources (raster)

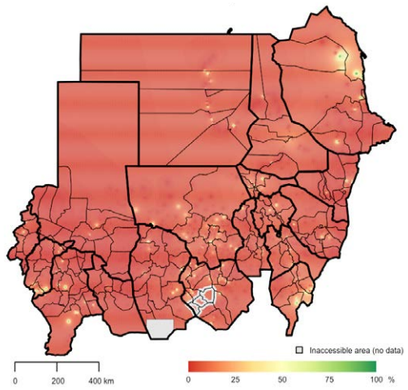


FIGURE 91:
IYCF: Diet: Protein-rich plant sources

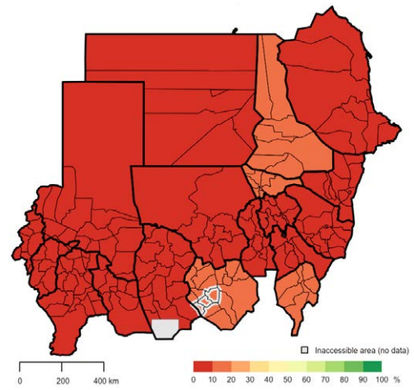


FIGURE 92:
IYCF: Diet: Protein-rich (any source) (raster)

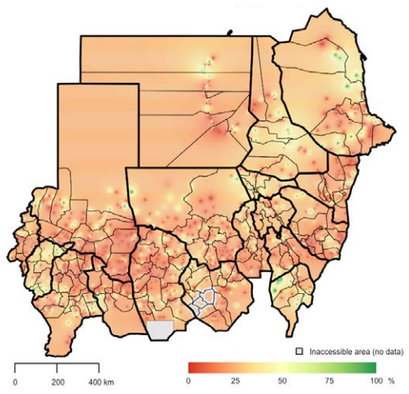
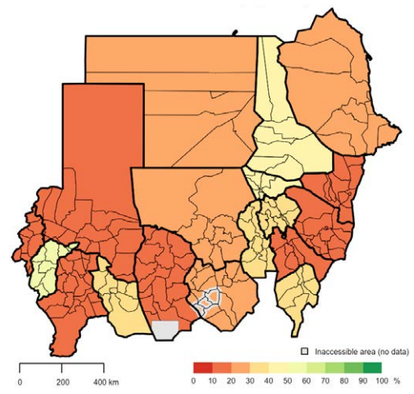


FIGURE 93:
IYCF: Diet: Protein-rich (any source)

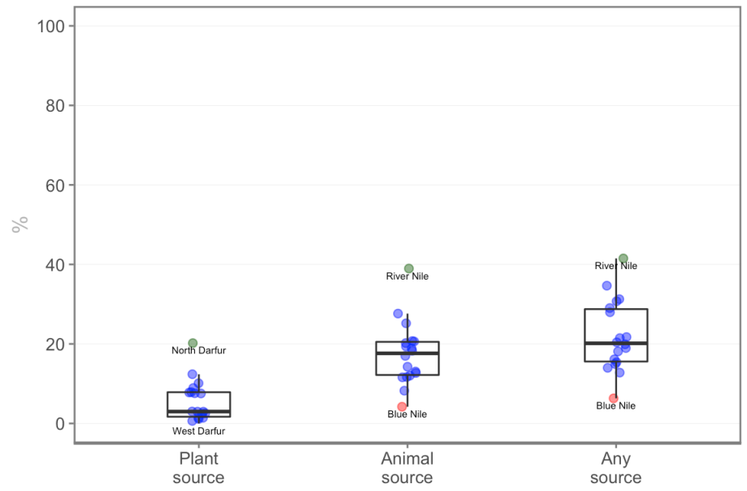


3.3.3 Child consumption of vitamin A-rich foods

Child consumption of vitamin A average results

Child consumption of vitamin A-rich foods from any source was low at 23.4 per cent (95 per cent CI: 0.01-50.1 per cent). Animal sources, rather than plant sources, constituted the majority of vitamin A-rich foods consumed by children, with 19.0 per cent (95 per cent CI: 0.01-47.12 per cent) from animal sources compared to 6.6 per cent (95 per cent CI: 0.01-21.29 per cent) from plant sources. The same pattern of consumption of vitamin A-rich foods existed at the state level, with small inter-state variability *(see Figure 94)*.

FIGURE 94: Box plot of state results for child consumption of vitamin A-rich foods



The same pattern of vitamin A-rich food consumption for children was found at the locality level, but with greater intra-state and inter-locality variability. About 87.5 per cent of localities had fewer than 50 per cent of children who consumed vitamin A-rich foods from any source, while 20 per cent of localities had no children who consumed vitamin A-rich foods from any source. Animal-source vitamin A-rich foods were the main sources of protein for those children who consumed vitamin A-rich foods in the localities *(see Figure 95)*.

Table 23 and Table 24 present results by locality, by state and at the national level for estimates of consumption of vitamin A-rich foods from plant sources, animal sources and from any source.

FIGURE 95: Box plot of locality results for child consumption of vitamin A-rich foods

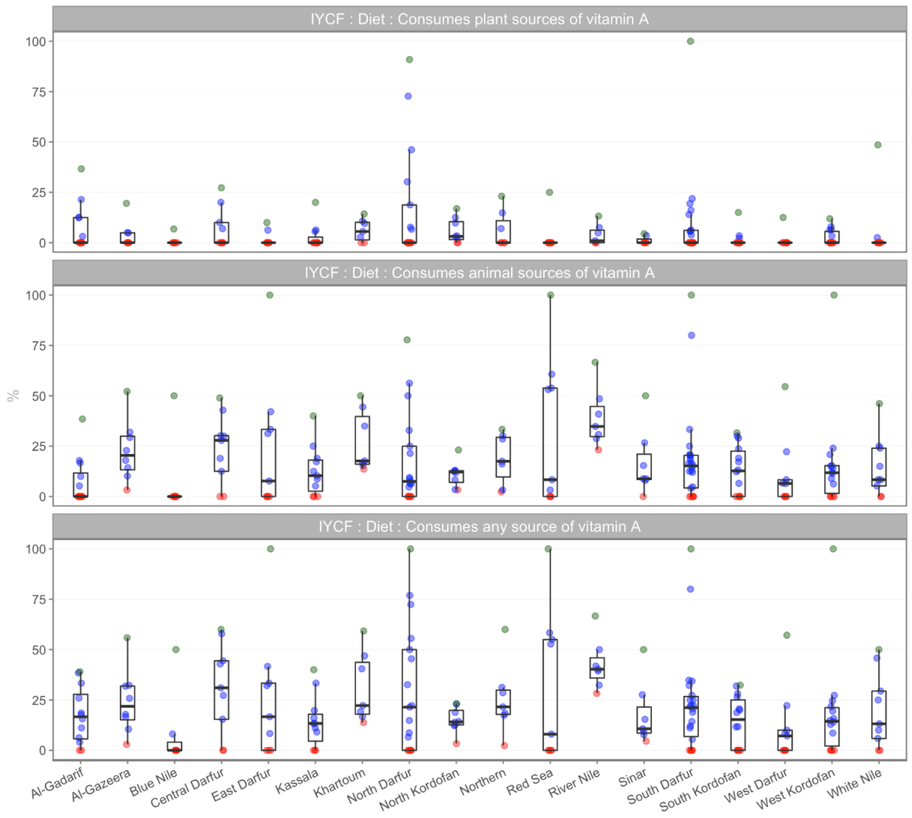


Table 23: Child consumption of vitamin A-rich foods by state and national

State	Plant sources of vitamin A %			Animal sources of vitamin A %			Any source of vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	8.91	0.01	30.96	8.25	0.01	36.94	18.13	0.01	49.54
Al-Gazeera	2.97	0.01	14.88	20.21	0.01	44.59	21.73	0.01	46.78
Blue Nile	1.42	0.01	6.07	4.20	0.01	21.43	6.32	0.01	26.12
Central Darfur	7.59	0.01	28.48	20.63	0.01	52.91	29.02	0.01	63.39
East Darfur	1.42	0.01	17.55	18.28	0.01	44.66	21.47	0.01	53.41
Kassala	2.47	0.01	26.85	14.26	0.01	44.12	14.93	0.01	44.93
Khartoum	7.78	0.01	24.98	27.63	1.40	53.86	31.27	5.76	56.77
North Darfur	20.21	2.46	37.96	16.99	0.01	42.10	34.65	6.88	62.42
North Kordofan	7.53	0.01	17.93	11.68	0.01	24.51	16.14	1.66	30.61
Northern	10.12	0.01	30.63	20.73	0.01	47.36	30.74	4.02	57.47

Table 23: Child consumption of vitamin A-rich foods by state and national

State	Plant sources of vitamin A %			Animal sources of vitamin A %			Any source of vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Red Sea	0.63	0.01	4.71	19.38	0.01	38.91	18.97	0.01	38.28
River Nile	2.95	0.01	9.19	38.97	16.91	61.04	41.51	18.74	64.28
Sennar	2.55	0.01	10.53	18.85	0.01	41.09	20.41	0.01	42.96
South Darfur	12.38	0.01	26.86	25.19	0.01	80.01	27.97	0.01	66.14
South Kordofan	1.15	0.01	7.15	11.60	0.01	27.28	12.78	0.01	27.86
West Darfur	0.00	0.00	7.03	12.03	0.01	37.47	13.99	0.01	40.58
West Kordofan	3.01	0.01	10.41	13.06	0.01	33.67	15.39	0.01	40.81
White Nile	7.89	0.01	20.21	12.69	0.01	35.03	19.91	0.01	43.80
Sudan	6.56	0.01	21.29	19.02	0.01	47.12	23.44	0.01	50.09

Table 24: Child consumption of vitamin A-rich foods by locality and by state

Location	Plant sources of vitamin A %			Animal sources of vitamin A %			Any source of vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	6.25	0.00	17.95	38.46	16.13	68.81	40.54	16.63	68.31
El Golid	0.00	0.00	0.00	2.63	0.00	12.84	2.38	0.00	11.29
Merwoe	25.00	0.00	75.00	26.32	0.00	66.67	53.85	0.00	87.50
El Daba	14.89	1.67	33.33	4.08	0.00	26.73	20.69	4.16	42.94
Halfa	0.00	0.00	0.00	51.35	19.91	73.60	52.00	20.88	76.75
Delgo	0.00	0.00	0.00	13.33	0.00	35.32	12.77	0.00	30.09
El Burgaig	0.00	0.00	13.35	13.51	0.00	36.42	14.63	0.00	37.09
Northern State	10.12	0.01	30.63	20.73	0.01	47.36	30.74	4.02	57.47
El Matama	0.00	0.00	8.91	24.53	9.61	40.02	25.49	12.88	42.01
Shendi	6.78	0.00	21.75	33.33	16.13	50.85	39.39	21.28	57.14
Abu Hamad	0.00	0.00	0.00	34.78	5.53	69.27	33.33	5.52	69.27
Barbar	0.00	0.00	0.00	64.29	24.90	100.00	63.64	22.11	100.00
El Damar	3.19	0.00	11.12	45.12	31.43	59.80	46.05	31.72	64.18
Atbara	3.33	0.00	11.54	34.38	19.97	51.69	35.94	21.50	51.62
El Buhaira	4.29	0.00	11.77	21.25	10.43	35.54	26.23	13.07	39.08
River Nile State	2.95	0.01	9.19	38.97	16.91	61.04	41.51	18.74	64.28
Khartoum	0.00	0.00	14.29	38.46	14.29	68.46	40.00	15.61	75.00
Bahri	16.67	0.00	50.00	18.18	0.00	50.00	25.00	0.00	58.42
Um Durman	10.81	0.00	27.80	50.00	21.43	74.32	60.61	38.23	83.00
Um Bada	21.43	4.52	44.15	44.83	20.00	68.57	50.00	22.65	73.75

Table 24: Child consumption of vitamin A-rich foods by locality and by state

Location	Plant sources of vitamin A %			Animal sources of vitamin A %			Any source of vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Jebel Awlia	4.76	0.00	25.07	13.79	0.00	42.94	15.79	0.00	40.08
Sharg Elneel	0.00	0.00	0.00	13.33	0.00	40.00	10.53	0.00	37.55
Karrari	3.57	0.00	25.82	24.14	0.00	57.19	23.33	0.00	60.92
Khartoum State	7.78	0.01	24.98	27.63	1.40	53.86	31.27	5.76	56.77
Greater Medani	5.13	0.00	17.26	28.21	8.50	52.19	28.95	7.13	53.00
Ganub Elgazira	0.00	0.00	15.79	25.00	4.74	60.06	26.47	4.99	59.14
El Hassahisa	10.26	0.00	27.80	22.22	0.00	53.87	29.63	6.62	60.87
El Kamlin	0.00	0.00	8.84	9.68	0.00	24.48	10.00	0.00	25.48
Sharg El Gezira	0.00	0.00	16.70	3.45	0.00	24.14	2.94	0.00	26.10
Um Elqura	8.33	0.00	60.00	40.00	0.00	100.00	39.44	0.00	100.00
El Manaqil	0.00	0.00	0.00	15.79	0.00	37.09	14.81	0.00	35.32
El Qurashi	4.69	0.00	21.96	29.41	9.59	48.39	33.33	11.11	52.98
Al-Gazeera State	2.97	0.01	14.88	20.21	0.01	44.59	21.73	0.01	46.78
Sennar	3.12	0.00	15.64	22.22	3.40	50.08	25.00	0.00	50.04
Sharg Sennar	0.00	0.00	0.00	46.88	14.96	77.82	46.15	14.92	76.51
Sinja	0.00	0.00	0.00	9.46	2.06	19.42	8.33	2.06	17.76
Abu Hujar	4.17	0.00	21.44	6.67	0.00	27.31	13.33	0.00	35.01
El Dali	0.00	0.00	9.41	9.38	0.00	33.45	10.34	0.00	38.19
Es Suki	8.11	0.00	20.70	10.53	0.00	32.54	13.46	0.00	33.33
Ed Dinder	0.00	0.00	0.00	10.00	0.00	28.57	10.53	0.00	28.57
Sennar State	2.55	0.01	10.53	18.85	0.01	41.09	20.41	0.01	42.96
Ed Damazine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
El Tadamon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
El Roseiris	6.67	0.00	20.71	0.00	0.00	14.35	10.42	0.00	25.00
Baw	0.00	0.00	0.00	0.00	0.00	15.40	0.00	0.00	14.31
Geisan	0.00	0.00	0.00	40.00	0.00	100.00	40.00	0.00	100.00
El Kurmuk	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wad El Mahi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue Nile State	1.42	0.01	6.07	4.20	0.01	21.43	6.32	0.01	26.12
Kosti	2.86	0.00	13.64	13.33	1.67	34.40	17.07	2.12	35.16
Guli	0.00	0.00	0.00	24.14	0.00	56.01	25.00	4.98	57.89
Tendalti	0.00	0.00	15.40	26.32	0.00	62.52	27.27	0.00	60.90
Es Salam	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	12.54
Rabak	0.00	0.00	5.89	7.50	0.00	18.19	7.55	0.00	17.40
El Jabalain	4.35	0.00	27.27	9.52	0.00	50.00	10.53	0.00	44.44
El Diwaim	44.00	19.95	71.47	7.41	0.00	30.90	46.88	22.21	70.86
Um Rimta	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA

Table 24: Child consumption of vitamin A-rich foods by locality and by state

Location	Plant sources of vitamin A %			Animal sources of vitamin A %			Any source of vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Gitaina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White Nile State	7.89	0.01	20.21	12.69	0.01	35.03	19.91	0.01	43.80
Port Sudan	0.00	0.00	0.00	37.14	7.94	66.75	35.90	10.48	61.60
Swakin	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	9.09
El Gonob Welawlaib	0.00	0.00	0.00	100.00	77.71	100.00	100.00	72.66	100.00
Sinkat	0.00	0.00	0.00	0.00	0.00	36.88	0.00	0.00	40.08
Haya	0.00	0.00	0.00	7.69	0.00	28.59	7.69	0.00	28.15
Dordieb	0.00	0.00	11.76	58.82	35.00	85.00	59.26	34.98	83.38
Tokar	0.00	0.00	0.00	0.00	0.00	17.78	2.13	0.00	17.87
Agig	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gabaot Elma-aadin	26.67	0.00	55.56	54.55	22.18	83.38	55.17	23.08	80.05
Halaeeb (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red Sea State	0.63	0.01	4.71	19.38	0.01	38.91	18.97	0.01	38.28
Kassala Town	0.00	0.00	0.00	0.00	0.00	42.06	0.00	0.00	43.39
Refi Kassla	5.71	0.00	42.86	14.29	0.00	45.49	14.29	0.00	47.74
Rural Western Kassala	0.00	0.00	0.00	20.21	10.25	31.18	20.31	9.86	31.69
New Halfa	0.00	0.00	0.00	12.82	1.91	34.45	12.50	1.99	31.84
Refi Nahr Atbara	23.53	0.00	100.00	27.78	0.00	100.00	36.36	0.00	100.00
Rural Khashm Elgirba	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00
Rural Wad Elhilaiw	5.26	0.00	23.09	4.35	0.00	22.59	12.00	0.00	33.38
Rural Aroma	0.00	0.00	8.18	17.14	4.87	36.38	17.86	4.74	34.27
Refi North Delta	0.00	0.00	0.00	9.09	0.00	30.02	9.09	0.00	26.12
Refi Hamashkureib	0.00	0.00	0.00	0.00	0.00	17.65	0.00	0.00	16.70
Rural Telkok	0.00	0.00	0.00	46.15	7.66	90.02	46.15	11.46	87.57
Kassala State	2.47	0.01	26.85	14.26	0.01	44.12	14.93	0.01	44.93
Gedaref Town	13.33	0.00	42.14	0.00	0.00	14.32	16.00	0.00	42.86
Middle Geddaref	0.00	0.00	0.00	10.00	0.00	100.00	11.11	0.00	100.00
Elbutana	0.00	0.00	0.00	37.50	0.00	80.00	37.50	0.00	80.17
El Fashaga	0.00	0.00	0.00	6.25	0.00	37.50	6.25	0.00	37.50
El Rahad	36.84	7.68	87.54	0.00	0.00	0.00	37.93	7.37	83.38
Gala-a El Nahal	6.25	0.00	25.00	0.00	0.00	0.00	7.14	0.00	31.59
El Fao	0.00	0.00	8.17	11.36	0.00	25.88	12.50	2.44	28.13
El Qureisha	0.00	0.00	0.00	0.00	0.00	42.94	0.00	0.00	50.00
El Mafaza	3.85	0.00	28.63	0.00	0.00	55.69	12.50	0.00	52.18
Basunda	0.00	0.00	12.92	0.00	0.00	15.40	3.12	0.00	16.70

Table 24: Child consumption of vitamin A-rich foods by locality and by state

Location	Plant sources of vitamin A %			Animal sources of vitamin A %			Any source of vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Western Galabat	0.00	0.00	0.00	17.07	0.00	35.02	17.24	0.00	36.84
Eastern Galabat	11.11	0.00	60.75	33.33	0.00	100.00	44.44	0.00	90.33
Al-Gadarif State	8.91	0.01	30.96	8.25	0.01	36.94	18.13	0.01	49.54
Sheikan	15.52	5.33	30.78	10.87	1.69	25.81	17.19	5.87	30.42
Um Rawaba	2.67	0.00	9.54	5.00	0.00	15.07	4.48	0.00	13.80
Um Dam Haj Ahmed	12.50	2.55	26.00	6.38	0.00	18.07	19.61	8.17	35.09
El Rahad	5.88	0.00	17.89	12.50	0.00	32.20	18.18	0.00	38.49
Bara	2.33	0.00	9.81	8.00	0.00	20.33	11.48	3.11	23.42
Gharb Bara	0.00	0.00	0.00	21.74	6.12	44.01	20.75	6.24	39.77
Soudari	9.09	0.00	26.14	17.11	5.25	36.07	19.67	5.87	36.63
Gebrat El Sheikh	1.79	0.00	10.87	16.39	3.91	34.01	16.39	4.25	32.15
North Kordofan State	7.53	0.01	17.93	11.68	0.01	24.51	16.14	1.66	30.61
Kadugli	2.86	0.00	15.56	18.87	3.70	37.19	23.68	9.95	41.96
Reif Shargi	0.00	0.00	0.00	13.04	1.85	26.80	11.36	0.00	25.41
Dilling	0.00	0.00	16.72	0.00	0.00	20.04	0.00	0.00	21.76
El Quoz	5.26	0.00	15.39	12.50	0.00	32.44	17.78	2.49	36.85
Habila	0.00	0.00	0.00	26.47	13.33	41.90	27.78	13.14	42.24
Abassiya	0.00	0.00	0.00	20.00	3.32	42.89	20.51	4.35	43.76
El Rashad	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	15.38
Abu Jubaiha	0.00	0.00	0.00	10.00	0.00	40.05	9.52	0.00	39.32
El Tadamon	0.00	0.00	0.00	0.00	0.00	13.82	2.00	0.00	12.51
Talodi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ghadeer	0.00	0.00	0.00	0.00	0.00	13.64	0.00	0.00	13.82
El Leri	0.00	0.00	0.00	12.00	0.00	28.57	11.76	0.00	28.24
Abu Karshola	3.12	0.00	18.76	29.03	11.31	50.09	31.58	11.11	54.60
Delami	0.00	0.00	0.00	0.00	0.00	13.38	0.00	0.00	17.40
South Kordofan State	1.15	0.01	7.15	11.60	0.01	27.28	12.78	0.01	27.86
Abu Zabad	0.00	0.00	0.00	13.33	0.00	35.15	13.46	0.00	30.78
ElKhiwai	3.57	0.00	17.67	22.73	0.00	50.12	25.00	2.88	56.29
Ghubaish	0.00	0.00	0.00	7.69	0.00	18.76	7.50	0.00	18.61
El Nuhud	5.77	0.00	19.51	12.96	2.44	28.57	19.44	4.68	39.03
El Idia	4.65	0.00	19.47	12.50	0.00	32.15	19.15	6.24	38.46
Wad Benda	5.45	0.00	20.83	15.22	3.70	32.50	14.81	4.48	32.76
Lagawa	0.00	0.00	12.03	22.22	3.57	50.00	25.00	4.76	50.13
Elsunut	0.00	0.00	0.00	16.67	2.76	41.95	17.50	3.31	41.48
Keilik	0.00	0.00	5.90	0.00	0.00	17.72	0.00	0.00	21.05

Table 24: Child consumption of vitamin A-rich foods by locality and by state

Location	Plant sources of vitamin A %			Animal sources of vitamin A %			Any source of vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Es Salam	14.29	3.84	27.13	15.38	5.54	29.32	24.68	11.98	40.76
Babanusa	0.00	0.00	0.00	7.69	0.00	22.33	7.14	0.00	24.15
Abyei	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
El Dibab	0.00	0.00	0.00	33.33	0.00	100.00	40.00	0.00	100.00
El Meiram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
West Kordofan State	3.01	0.01	10.41	13.06	0.01	33.67	15.39	0.01	40.81
El Fasher	18.52	2.32	37.51	8.70	0.00	29.03	28.57	4.98	53.71
Tawila	40.00	0.00	100.00	7.69	0.00	50.00	45.45	0.00	100.00
Melit	0.00	0.00	0.00	21.43	0.00	63.67	22.22	0.00	55.56
Um Kadada	0.00	0.00	0.00	0.00	0.00	9.77	0.00	0.00	9.69
Kebkabiya	90.70	73.51	100.00	9.62	0.00	26.39	100.00	100.00	100.00
Kutum	0.00	0.00	0.00	50.00	0.00	100.00	50.00	0.00	100.00
El Mahalha	0.00	0.00	0.00	45.00	6.79	85.71	44.44	0.00	85.80
Saraf Omra	68.57	29.62	95.01	6.06	0.00	21.22	67.86	29.29	94.31
El Serief	0.00	0.00	0.00	6.25	0.00	20.85	5.66	0.00	21.16
Dar Elsalam	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kelemando	6.67	0.00	34.81	15.79	0.00	46.69	17.65	0.00	50.00
El Tawisha	0.00	0.00	0.00	9.09	0.00	21.46	8.62	0.00	23.93
Um Baru	18.18	0.00	40.08	66.67	20.00	100.00	70.00	22.59	100.00
El Lait	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ELkuma	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00
El Tina	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kernoi	21.54	4.63	40.33	33.33	16.10	54.27	33.33	15.61	55.00
North Darfur State	20.21	2.46	37.96	16.99	0.01	42.10	34.65	6.88	62.42
Nyala South	6.82	0.00	20.41	14.55	3.20	33.33	15.38	3.12	29.06
Nyala North	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Es Salam	0.00	0.00	0.00	0.00	0.00	9.69	0.00	0.00	10.06
El Wihda	0.00	0.00	15.45	0.00	0.00	16.72	0.00	0.00	22.26
Mershing	13.95	0.00	31.58	13.33	0.00	29.63	26.92	6.44	46.15
Beliel	0.00	0.00	13.80	20.83	0.00	47.83	23.08	3.55	50.00
Nitega	20.00	0.00	56.35	12.50	0.00	33.33	33.33	9.09	68.23
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	5.26	0.00	19.39	4.55	0.00	19.54	11.76	0.00	31.07
Shattaya	4.08	0.00	22.24	21.74	3.32	38.91	22.86	6.11	42.57
Buram	6.45	0.00	28.60	16.22	0.00	35.75	23.53	3.84	53.64
Gereida	0.00	0.00	13.06	20.83	0.00	60.13	23.08	0.00	66.67

Table 24: Child consumption of vitamin A-rich foods by locality and by state

Location	Plant sources of vitamin A %			Animal sources of vitamin A %			Any source of vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Sunta	16.67	0.00	46.18	50.00	9.05	88.89	50.00	11.06	90.91
El Radoum	4.55	0.00	22.74	15.79	0.00	40.00	16.13	0.00	40.00
Tulus	0.00	0.00	0.00	72.08	0.00	100.00	80.91	0.00	100.00
Damso	0.00	0.00	100.00	21.11	0.00	100.00	25.00	0.00	100.00
Ed Elfursan	100.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	100.00
Kubum	0.00	0.00	7.32	4.00	0.00	13.46	5.48	0.00	16.38
Kateila	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rehaid Elbirdi	18.18	7.38	34.69	15.25	4.61	28.58	30.77	17.12	46.84
Um Dafoug	17.14	3.12	34.29	13.16	0.00	33.33	17.95	5.63	35.73
South Darfur State	12.38	0.01	26.86	25.19	0.01	80.01	27.97	0.01	66.14
Abu Jabra	0.00	0.00	0.00	33.33	0.00	80.00	33.33	0.00	71.43
Abu Karinka	0.00	0.00	0.00	11.11	0.00	66.67	0.00	0.00	80.00
Bahr El Arab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adila	0.00	0.00	0.00	31.58	5.85	61.18	31.58	6.23	60.90
Ed Dain	0.00	0.00	0.00	14.29	0.00	55.78	12.50	0.00	67.00
Assalaya	6.67	0.00	33.33	7.69	0.00	35.40	7.69	0.00	40.95
El Firdous	0.00	0.00	77.92	100.00	100.00	100.00	100.00	100.00	100.00
Shia-ria	0.00	0.00	0.00	0.00	0.00	35.32	0.00	0.00	33.33
Yassin	14.29	0.00	100.00	0.00	0.00	50.00	25.00	0.00	100.00
East Darfur State	1.42	0.01	17.55	18.28	0.01	44.66	21.47	0.01	53.41
El Geneina	0.00	0.00	14.31	9.30	0.00	31.06	10.71	0.00	34.38
Habila	0.00	0.00	0.00	5.56	0.00	41.73	5.13	0.00	57.14
Kulbus	0.00	0.00	0.00	20.00	0.00	62.81	20.00	0.00	63.64
Beida	0.00	0.00	33.33	50.00	13.58	100.00	50.00	10.99	100.00
Foro Baranga	0.00	0.00	0.00	15.38	0.00	42.94	14.29	0.00	42.94
Kereneik	0.00	0.00	8.11	3.45	0.00	19.36	3.70	0.00	18.93
Sirba	0.00	0.00	0.00	0.00	0.00	27.34	0.00	0.00	23.64
Jebel Moon	0.00	0.00	33.33	7.14	0.00	40.08	14.29	0.00	57.29
West Darfur State	0.00	0.00	7.03	12.03	0.01	37.47	13.99	0.01	40.58
Zalingi	2.44	0.00	14.30	26.00	7.50	48.41	28.00	9.09	52.01
Wadi Salih	18.18	0.00	61.59	25.00	0.00	66.67	42.86	0.00	100.00
Mukjar	25.00	0.00	66.67	28.57	0.00	84.17	58.33	14.29	100.00
Central Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bendasi	0.00	0.00	33.33	NA	NA	NA	NA	NA	NA
Nertiti	5.41	0.00	21.79	44.74	17.60	65.52	51.35	24.34	71.81
Azum	11.11	0.00	33.33	18.75	0.00	45.49	28.57	9.09	50.08

Table 24: Child consumption of vitamin A-rich foods by locality and by state

Location	Plant sources of vitamin A %			Animal sources of vitamin A %			Any source of vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Um Dukhun	0.00	0.00	11.48	21.62	0.00	53.36	22.73	0.00	56.04
Central Darfur State	7.59	0.01	28.48	20.63	0.01	52.91	29.02	0.01	63.39

Spatial distribution of child vitamin A consumption

Low rates of vitamin A-rich food consumption from any source were evenly spread throughout Sudan, with pockets of high consumption rates in parts of Red Sea state, White Nile state and Northern Darfur state *(see Figure 96, Figure 98 and Figure 100)*.

FIGURE 96:
IYCF: Diet: Consumes plant sources of vitamin A (raster)

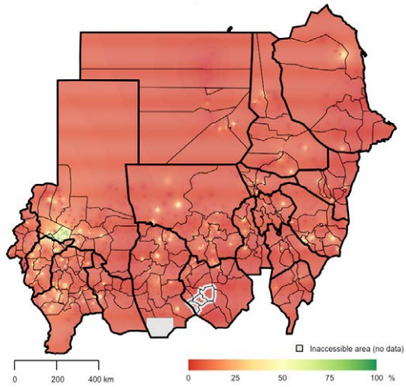


FIGURE 97:
IYCF: Diet: Consumes plant sources of vitamin A

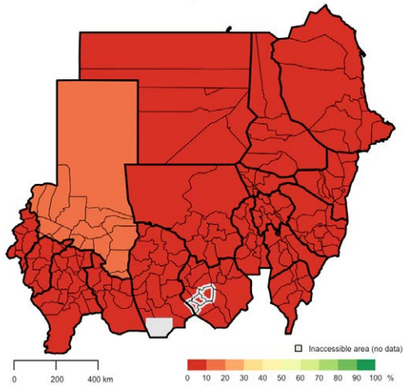


FIGURE 98:
IYCF: Diet: Consumes animal sources of vitamin A (raster)

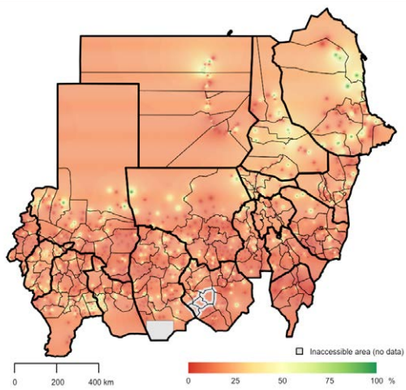


FIGURE 99:
IYCF: Diet: Consumes animal sources of vitamin A

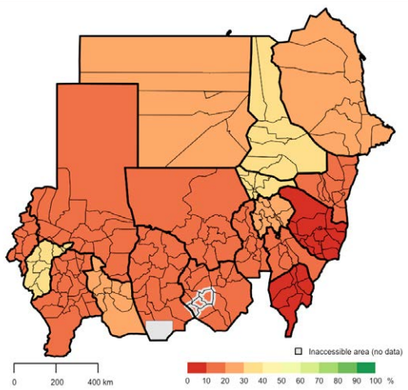


FIGURE 100:
IYCF: Diet: Consumes any source of vitamin A (raster)

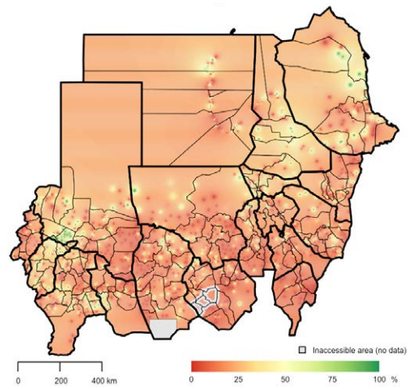
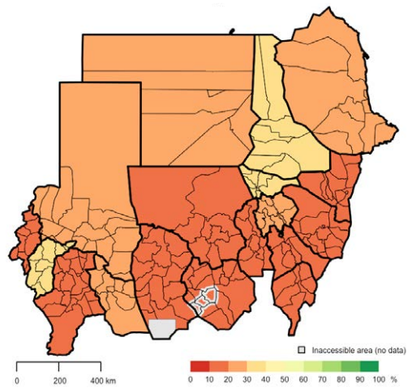


FIGURE 101:
IYCF: Diet: Consumes any source of vitamin A

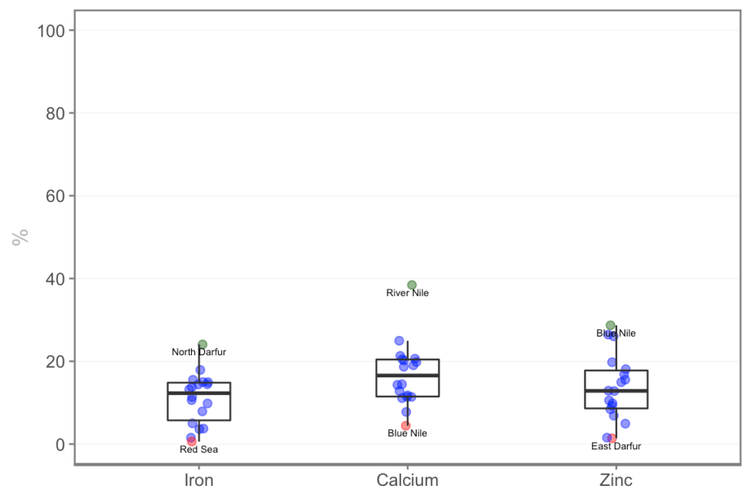


3.3.4 Child consumption of iron-, calcium- and zinc-rich foods

Child consumption of iron-, calcium-, and zinc-rich foods average results

Child consumption of iron-, calcium- and zinc-rich foods was low at 12.3 per cent (95 per cent CI: 0.01-31.1 per cent), 17.6 per cent (95 per cent CI: 0.01-44.1 per cent) and 15.0 per cent (95 per cent CI: 0.01-34.5 per cent) respectively. At the state level, consumption of these other micronutrients was low, with very small inter-state variability *(see Figure 102)*.

FIGURE 102: Box plot of state and locality results for child consumption of foods rich in iron, calcium and zinc



At the locality level, there was high intra-state and inter-locality variability in the child consumption of these three micronutrients. About 94.6 per cent of localities had fewer than 50 per cent of children who consumed iron-rich foods, while 41.5 per cent of localities had no children who consumed iron-rich foods. About 93.5 per cent of localities had fewer than 50 per cent of children who consumed calcium-rich foods, while 24.3 per cent of localities had no children who consumed calcium-rich foods. About 93.5 per cent of localities had fewer than 50 per cent of children who consumed zinc-rich foods, while 37.3 per cent of localities had no children who consumed zinc-rich foods. Across localities, there was low child consumption of iron-, calcium- and zinc-rich foods *(see Figure 103)*.

Table 25 and Table 26 present results by locality, by state and at the national level for estimates of child consumption of iron-, calcium- and zinc-rich foods.

FIGURE 103: Box plot of locality results for child consumption of foods rich in iron, calcium and zinc

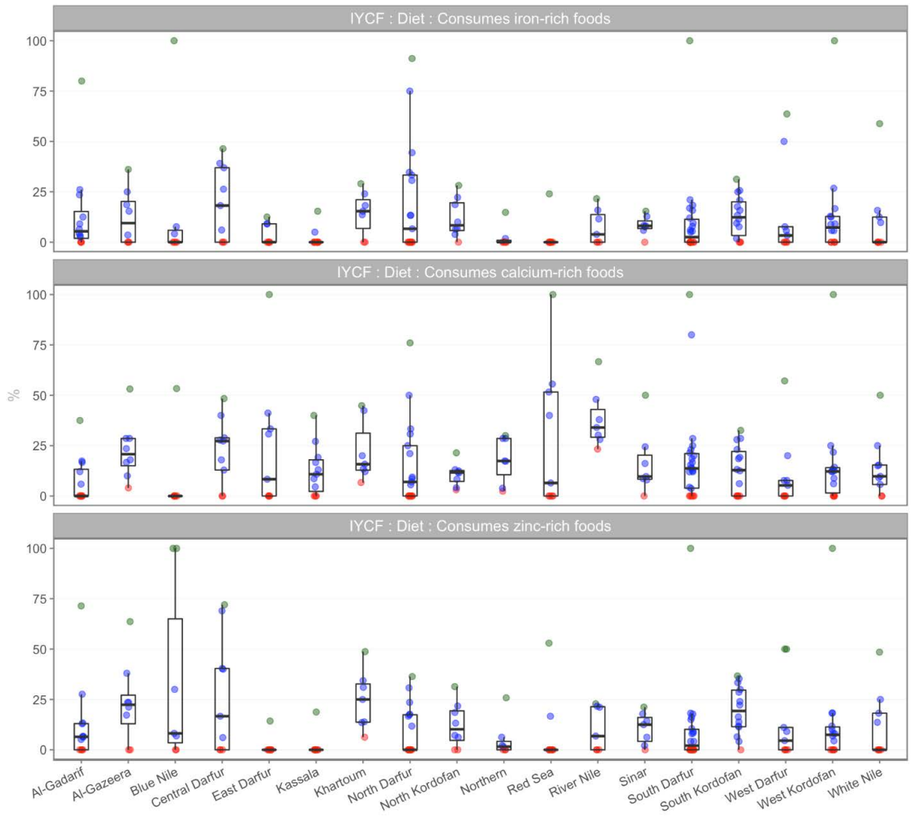


Table 25: Child consumption of iron-, calcium- and zinc-rich foods by state and national

State	Iron-rich foods %			Calcium-rich foods %			Zinc-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	14.99	0.01	38.99	7.77	0.01	36.29	12.81	0.01	35.46
Al-Gazeera	13.21	0.01	33.43	19.83	0.01	44.23	16.85	0.01	40.36
Blue Nile	10.62	0.01	26.26	4.42	0.01	24.34	28.69	7.91	49.47
Central Darfur	17.91	0.01	44.16	20.20	0.01	52.67	26.04	1.94	50.15
East Darfur	3.74	0.01	27.09	20.63	0.01	49.07	1.39	0.01	14.56
Kassala	1.55	0.01	16.75	14.31	0.01	40.79	1.56	0.01	14.48
Khartoum	14.96	0.01	34.70	21.31	0.01	45.50	26.44	3.87	49.00
North Darfur	24.08	1.63	46.53	14.46	0.01	37.41	9.24	0.01	29.65
North Kordofan	14.45	1.99	26.91	11.75	0.01	25.02	14.95	3.31	26.59
Northern	3.61	0.01	12.50	20.51	0.01	48.38	6.86	0.01	26.55
Red Sea	0.59	0.01	5.47	19.03	0.01	38.60	4.93	0.01	22.14
River Nile	5.01	0.01	13.80	38.44	15.21	61.68	9.83	0.57	19.09
Sennar	7.90	0.01	22.54	18.67	0.01	39.18	10.55	0.01	26.50
South Darfur	13.75	0.01	30.60	24.96	0.01	72.06	12.89	1.50	24.28
South Kordofan	11.38	0.01	28.04	11.40	0.01	26.45	19.78	0.38	39.18
West Darfur	14.41	0.01	40.71	11.11	0.01	36.62	15.55	0.01	42.02
West Kordofan	9.82	0.01	31.93	12.81	0.01	35.67	8.41	0.01	31.56
White Nile	15.53	0.01	34.18	11.40	0.01	33.46	18.09	0.01	37.96
Sudan	12.28	0.01	31.05	17.62	0.01	44.07	14.99	0.01	34.51

Table 26: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-rich foods %			Calcium-rich foods %			Zinc-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	1.69	0.00	10.54	38.64	16.20	65.00	5.13	0.00	18.76
El Golid	0.00	0.00	0.00	2.13	0.00	11.87	1.89	0.00	11.56
Merwoe	0.00	0.00	0.00	27.27	0.00	66.77	21.43	0.00	73.42
El Daba	15.00	0.00	37.50	3.70	0.00	25.96	0.00	0.00	0.00
Halfa	0.00	0.00	0.00	52.63	15.97	77.42	0.00	0.00	10.71
Delgo	2.13	0.00	12.21	11.36	0.00	33.38	7.69	0.00	25.00
El Burgaig	0.00	0.00	12.52	14.29	0.00	40.00	0.00	0.00	11.78

Table 26: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-rich foods %			Calcium-rich foods %			Zinc-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Northern State	3.61	0.01	12.50	20.51	0.01	48.38	6.86	0.01	26.55
El Matama	0.00	0.00	9.09	25.58	9.99	41.52	0.00	0.00	8.83
Shendi	15.22	2.77	34.40	34.09	15.14	54.56	7.14	0.00	20.02
Abu Hamad	0.00	0.00	0.00	35.29	7.08	66.67	0.00	0.00	0.00
Barbar	0.00	0.00	0.00	62.50	25.00	100.00	0.00	0.00	0.00
El Damar	3.23	0.00	10.40	42.22	27.92	59.72	21.65	12.16	32.99
Atbara	0.00	0.00	5.67	30.00	13.32	45.46	17.81	4.40	32.84
El Buhaira	20.97	10.23	33.75	21.92	10.53	34.25	20.69	9.52	35.60
River Nile State	5.01	0.01	13.80	38.44	15.21	61.68	9.83	0.57	19.09
Khartoum	25.00	4.76	55.19	40.00	17.38	70.07	35.71	11.90	60.72
Bahri	15.38	0.00	50.17	8.33	0.00	40.00	7.69	0.00	40.95
Um Durman	29.03	8.68	51.89	42.50	19.93	66.72	30.56	10.33	52.41
Um Bada	31.25	5.49	56.70	18.75	0.00	41.73	52.38	30.27	75.04
Jebel Awlia	11.11	0.00	38.46	15.00	0.00	41.18	11.11	0.00	38.94
Sharg Elneel	0.00	0.00	14.31	12.50	0.00	38.11	26.32	5.54	47.38
Karrari	0.00	0.00	9.39	18.42	0.00	46.48	16.67	0.00	44.49
Khartoum State	14.96	0.01	34.70	21.31	0.01	45.50	26.44	3.87	49.00
Greater Medani	14.89	0.00	35.00	25.81	7.41	48.84	21.05	6.65	40.04
Ganub Elgazira	0.00	0.00	15.02	24.00	4.50	53.93	0.00	0.00	17.87
El Hassahisa	19.44	3.12	42.90	23.81	0.00	52.51	17.14	3.22	38.72
El Kamlin	0.00	0.00	18.62	9.80	0.00	25.50	0.00	0.00	10.26
Sharg El Gezira	4.88	0.00	30.43	4.17	0.00	23.12	19.05	0.00	50.08
Um Elqura	14.29	0.00	66.67	40.00	0.00	89.31	20.00	0.00	71.56
El Manaqil	23.81	3.85	54.58	15.79	0.00	36.88	26.32	4.15	57.14
El Qurashi	15.38	2.62	31.06	29.55	11.06	51.12	21.62	5.86	40.91
Al-Gazeera State	13.21	0.01	33.43	19.83	0.01	44.23	16.85	0.01	40.36
Sennar	11.76	0.00	35.33	20.83	0.00	44.13	18.75	0.00	39.42
Sharg Sennar	0.00	0.00	0.00	46.67	18.18	82.40	0.00	0.00	15.79
Sinja	8.25	1.33	17.20	8.82	1.43	17.92	14.08	5.13	24.59
Abu Hujar	12.12	0.00	33.33	7.69	0.00	25.71	18.18	0.00	45.47
El Dali	9.09	0.00	31.83	9.68	0.00	37.04	8.70	0.00	28.22
Es Suki	10.00	1.96	26.49	9.26	0.00	35.29	6.38	0.00	20.03
Ed Dinder	8.11	0.00	23.33	10.71	0.00	28.57	6.90	0.00	25.05
Sennar State	7.90	0.01	22.54	18.67	0.01	39.18	10.55	0.01	26.50

Table 26: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-rich foods %			Calcium-rich foods %			Zinc-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ed Damazine	0.00	0.00	14.34	0.00	0.00	0.00	13.33	0.00	45.52
El Tadamon	100.00	100.00	100.00	0.00	0.00	0.00	100.00	100.00	100.00
El Roseiris	4.17	0.00	18.19	1.92	0.00	15.74	8.70	0.00	23.35
Baw	0.00	0.00	0.00	0.00	0.00	16.03	0.00	0.00	0.00
Geisan	20.00	0.00	66.67	41.67	0.00	100.00	37.50	0.00	81.93
El Kurmuk	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	100.00
Wad El Mahi	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	28.57
Blue Nile State	10.62	0.01	26.26	4.42	0.01	24.34	28.69	7.91	49.47
Kosti	12.50	0.00	29.46	12.50	0.00	30.43	19.57	4.17	38.72
Guli	0.00	0.00	16.73	25.00	0.00	57.92	0.00	0.00	17.65
Tendalti	0.00	0.00	14.29	5.56	0.00	41.73	0.00	0.00	0.00
Es Salam	0.00	0.00	0.00	0.00	0.00	11.14	0.00	0.00	0.00
Rabak	16.00	0.00	33.33	7.14	0.00	17.79	18.42	3.02	34.49
El Jabalain	15.79	0.00	50.00	12.50	0.00	46.69	28.57	0.00	63.64
El Diwaim	57.14	31.19	84.64	8.33	0.00	30.50	50.00	24.95	79.34
Um Rimta	0.00	0.00	50.00	NA	NA	NA	7.69	0.00	61.17
El Gitaina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White Nile State	15.53	0.01	34.18	11.40	0.01	33.46	18.09	0.01	37.96
Port Sudan	0.00	0.00	14.29	36.00	10.00	62.99	0.00	0.00	27.78
Swakin	0.00	0.00	0.00	0.00	0.00	7.76	0.00	0.00	0.00
El Gonob Welawlaib	0.00	0.00	0.00	100.00	77.74	100.00	33.33	0.00	100.00
Sinkat	0.00	0.00	0.00	0.00	0.00	35.73	4.55	0.00	35.71
Haya	0.00	0.00	0.00	8.33	0.00	28.12	0.00	0.00	0.00
Dordieb	0.00	0.00	12.04	41.18	15.37	68.44	18.52	0.00	45.47
Tokar	0.00	0.00	0.00	0.00	0.00	16.30	0.00	0.00	0.00
Agig	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gabaot Elma-aadin	26.32	0.00	50.13	55.00	28.51	83.40	56.00	23.03	80.09
Halaeeb (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red Sea State	0.59	0.01	5.47	19.03	0.01	38.60	4.93	0.01	22.14
Kassala Town	0.00	0.00	0.00	0.00	0.00	37.69	0.00	0.00	0.00
Refi Kassla	0.00	0.00	0.00	15.00	0.00	48.36	0.00	0.00	20.05
Rural Western Kassala	0.00	0.00	5.11	20.00	11.19	32.79	0.00	0.00	5.20
New Halfa	0.00	0.00	0.00	12.82	0.00	32.01	0.00	0.00	10.81

Table 26: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-rich foods %			Calcium-rich foods %			Zinc-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi Nahr Atbara	12.50	0.00	100.00	27.27	0.00	100.00	0.00	0.00	0.00
Rural Khashm Elgirba	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Rural Wad Elhilaiw	5.41	0.00	24.00	5.00	0.00	19.23	0.00	0.00	0.00
Rural Aroma	0.00	0.00	8.11	17.39	5.10	33.38	0.00	0.00	0.00
Refi North Delta	0.00	0.00	0.00	8.82	0.00	26.10	0.00	0.00	0.00
Refi Hamashkureib	0.00	0.00	0.00	0.00	0.00	16.73	0.00	0.00	0.00
Rural Telkok	0.00	0.00	0.00	43.75	10.00	91.67	10.53	0.00	45.68
Kassala State	1.55	0.01	16.75	14.31	0.01	40.79	1.56	0.01	14.48
Gedaref Town	12.90	0.00	37.55	0.00	0.00	16.67	8.33	0.00	28.03
Middle Geddaref	7.14	0.00	50.00	7.69	0.00	75.00	9.09	0.00	56.83
Elbutana	12.50	0.00	44.44	40.00	0.00	75.10	10.00	0.00	44.49
El Fashaga	0.00	0.00	0.00	4.76	0.00	35.35	0.00	0.00	0.00
El Rahad	26.67	5.56	65.08	0.00	0.00	0.00	12.90	0.00	37.06
Gala-a El Nahal	5.41	0.00	23.33	0.00	0.00	0.00	0.00	0.00	0.00
El Fao	4.44	0.00	17.32	11.63	1.76	25.58	5.71	0.00	19.36
El Qureisha	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00
El Mafaza	5.26	0.00	27.34	0.00	0.00	43.78	12.00	0.00	38.90
Basunda	6.90	0.00	22.52	0.00	0.00	11.83	7.69	0.00	25.84
Western Galabat	2.70	0.00	15.38	17.78	0.00	38.46	7.14	0.00	20.99
Eastern Galabat	68.99	0.00	100.00	28.57	0.00	100.00	64.29	0.00	100.00
Al-Gadarif State	14.99	0.01	38.99	7.77	0.01	36.29	12.81	0.01	35.46
Sheikan	26.39	12.72	41.86	10.64	2.48	24.39	27.66	13.91	44.90
Um Rawaba	6.56	0.00	16.67	5.00	0.00	16.68	6.85	1.14	14.87
Um Dam Haj Ahmed	28.57	15.37	45.65	6.52	0.00	17.86	31.43	14.81	50.05
El Rahad	3.33	0.00	16.70	11.90	0.00	33.39	0.00	0.00	9.69
Bara	17.65	5.65	31.75	8.20	0.00	21.75	18.75	5.12	33.33
Gharb Bara	5.08	0.00	18.40	21.82	5.85	37.78	10.64	2.04	22.93
Soudari	10.00	0.00	25.38	17.86	5.99	35.84	9.09	1.54	20.86
Gebrat El Sheikh	3.64	0.00	14.30	16.67	4.34	36.17	1.75	0.00	9.81
North Kordofan State	14.45	1.99	26.91	11.75	0.01	25.02	14.95	3.31	26.59
Kadugli	10.64	0.00	29.67	19.44	5.71	39.04	34.62	16.11	55.57
Reif Shargi	0.00	0.00	1.82	11.86	0.00	26.68	11.84	1.46	22.85
Dilling	10.00	0.00	40.00	0.00	0.00	22.73	34.62	4.33	66.67

Table 26: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-rich foods %			Calcium-rich foods %			Zinc-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Quoz	22.73	7.89	38.27	11.11	0.00	32.60	18.60	6.12	34.17
Habila	4.26	0.00	17.03	26.67	12.72	41.18	4.65	0.00	18.38
Abassiya	0.00	0.00	12.50	20.00	2.26	43.49	6.45	0.00	22.24
El Rashad	19.44	0.00	47.74	0.00	0.00	18.20	34.78	11.46	61.79
Abu Jubaiha	8.00	0.00	38.19	10.53	0.00	43.81	20.00	0.00	55.59
El Tadamon	10.53	0.00	22.74	1.96	0.00	14.91	10.87	0.00	24.33
Talodi	21.43	4.32	50.00	0.00	0.00	0.00	21.05	5.25	50.00
Ghadeer	0.00	0.00	0.00	0.00	0.00	14.31	0.00	0.00	0.00
El Leri	0.00	0.00	12.91	12.12	1.88	29.18	4.76	0.00	20.00
Abu Karshola	30.43	10.33	50.00	28.00	9.95	48.72	34.38	13.60	61.54
Delami	15.38	0.00	50.00	0.00	0.00	15.38	30.43	5.54	58.33
South Kordofan State	11.38	0.01	28.04	11.40	0.01	26.45	19.78	0.38	39.18
Abu Zabad	2.56	0.00	15.81	10.71	0.00	28.57	2.78	0.00	14.82
ElKhiwai	6.45	0.00	27.79	23.53	0.00	52.71	0.00	0.00	18.75
Ghubaish	7.50	0.00	21.22	7.41	0.00	18.03	7.89	0.00	22.59
El Nuhud	9.80	0.00	26.20	12.77	2.17	27.98	3.85	0.00	15.23
El Idia	12.50	0.00	26.68	12.90	0.00	29.77	7.50	0.00	18.65
Wad Benda	6.12	0.00	20.00	14.00	4.40	31.95	9.86	1.49	26.67
Lagawa	0.00	0.00	15.83	21.05	3.83	47.62	11.11	0.00	33.33
Elsunut	9.52	0.00	32.26	17.86	2.83	40.04	10.34	0.00	29.44
Keilik	0.00	0.00	17.90	0.00	0.00	20.00	0.00	0.00	13.67
Es Salam	27.50	13.22	43.09	11.86	4.04	21.88	17.86	5.87	32.29
Babanusa	0.00	0.00	10.37	6.98	0.00	25.04	0.00	0.00	12.52
Abyei	16.67	0.00	60.21	0.00	0.00	0.00	16.67	0.00	62.81
El Dibab	42.22	0.00	100.00	40.00	0.00	100.00	40.00	0.00	100.00
El Meiram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
West Kordofan State	9.82	0.01	31.93	12.81	0.01	35.67	8.41	0.01	31.56
El Fasher	18.42	2.20	40.80	9.76	0.00	27.60	11.54	0.00	32.64
Tawila	38.46	0.00	100.00	8.33	0.00	50.00	16.67	0.00	50.00
Melit	12.50	0.00	35.71	21.43	0.00	58.42	20.00	0.00	55.03
Um Kadada	0.00	0.00	9.68	0.00	0.00	11.13	0.00	0.00	10.71
Kebkabiya	91.30	74.17	100.00	9.09	0.00	25.00	0.00	0.00	11.80
Kutum	30.00	0.00	87.57	28.57	0.00	100.00	30.77	0.00	100.00

Table 26: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-rich foods %			Calcium-rich foods %			Zinc-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Mahalha	0.00	0.00	0.00	42.86	0.00	100.00	0.00	0.00	0.00
Saraf Omra	66.67	33.23	95.45	0.00	0.00	0.00	17.24	0.00	41.19
El Serief	0.00	0.00	0.00	6.38	0.00	22.01	0.00	0.00	0.00
Dar Elsalam	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kelemando	10.53	0.00	45.45	18.18	0.00	50.00	9.09	0.00	46.15
El Tawisha	0.00	0.00	0.00	8.33	0.00	21.22	0.00	0.00	0.00
Um Baru	33.33	5.25	63.69	64.52	11.01	100.00	14.29	0.00	36.36
El Lait	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ELkuma	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00
El Tina	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kernoi	21.67	4.91	39.48	32.26	15.77	50.06	21.74	3.55	39.54
North Darfur State	24.08	1.63	46.53	14.46	0.01	37.41	9.24	0.01	29.65
Nyala South	5.17	0.00	17.74	14.63	4.16	31.45	4.55	0.00	15.40
Nyala North	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Es Salam	0.00	0.00	12.03	0.00	0.00	10.35	0.00	0.00	13.67
El Wihda	0.00	0.00	20.00	0.00	0.00	15.40	0.00	0.00	0.00
Mershing	9.68	0.00	25.50	12.50	0.00	28.57	4.00	0.00	17.26
Beliel	0.00	0.00	10.03	22.58	3.99	50.10	16.67	0.00	43.90
Nitega	20.00	0.00	54.19	12.50	0.00	33.33	0.00	0.00	0.00
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	5.56	0.00	21.07	4.55	0.00	18.81	0.00	0.00	6.92
Shattaya	6.25	0.00	22.76	21.95	3.45	40.02	4.76	0.00	20.05
Buram	5.26	0.00	29.65	16.67	0.00	41.22	8.70	0.00	31.03
Gereida	0.00	0.00	13.67	20.00	0.00	58.99	0.00	0.00	0.00
El Sunta	16.67	0.00	50.17	46.67	7.12	90.00	18.75	0.00	50.00
El Radoum	10.53	0.00	30.00	16.13	0.00	36.36	20.83	3.55	45.49
Tulus	0.00	0.00	0.00	80.00	0.00	100.00	0.00	0.00	0.00
Damso	0.00	0.00	100.00	30.00	0.00	100.00	0.00	0.00	0.00
Ed Elfursan	100.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	100.00
Kubum	16.67	5.56	28.57	4.35	0.00	12.51	16.25	6.23	26.84
Kateila	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rehaid Elbirdi	18.75	6.76	32.84	15.38	5.52	27.66	10.47	1.92	23.90
Um Dafoug	16.28	2.94	37.06	13.33	0.00	33.33	8.33	0.00	21.43

Table 26: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-rich foods %			Calcium-rich foods %			Zinc-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Darfur State	13.75	0.01	30.60	24.96	0.01	72.06	12.89	1.50	24.28
Abu Jabra	0.00	0.00	0.00	36.36	0.00	100.00	0.00	0.00	0.00
Abu Karinka	0.00	0.00	0.00	11.11	0.00	66.67	0.00	0.00	0.00
Bahr El Arab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adila	0.00	0.00	0.00	30.77	11.08	62.04	0.00	0.00	0.00
Ed Dain	15.38	0.00	55.67	14.29	0.00	75.10	12.50	0.00	50.00
Assalaya	8.70	0.00	42.90	9.09	0.00	41.77	0.00	0.00	20.90
El Firdous	0.00	0.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
Shia-ria	0.00	0.00	44.44	0.00	0.00	40.14	0.00	0.00	37.63
Yassin	11.11	0.00	100.00	0.00	0.00	60.50	0.00	0.00	0.00
East Darfur State	3.74	0.01	27.09	20.63	0.01	49.07	1.39	0.01	14.56
El Geneina	9.30	0.00	30.79	8.33	0.00	28.57	12.50	0.00	34.70
Habila	0.00	0.00	0.00	5.56	0.00	50.00	0.00	0.00	0.00
Kulbus	11.11	0.00	57.29	16.67	0.00	62.71	9.09	0.00	46.18
Beida	58.33	11.73	100.00	53.33	11.03	100.00	56.25	0.00	100.00
Foro Baranga	0.00	0.00	0.00	14.29	0.00	47.35	0.00	0.00	0.00
Kereneik	3.70	0.00	16.70	3.45	0.00	19.13	3.70	0.00	17.40
Sirba	40.00	6.44	81.28	0.00	0.00	0.00	42.86	9.05	80.17
Jebel Moon	14.29	0.00	55.63	0.00	0.00	41.67	15.38	0.00	58.42
West Darfur State	14.41	0.01	40.71	11.11	0.01	36.62	15.55	0.01	42.02
Zalingi	16.67	2.32	39.42	22.73	5.00	43.93	16.28	2.55	39.05
Wadi Salih	15.38	0.00	54.27	25.40	0.00	66.67	17.16	0.00	54.55
Mukjar	50.00	0.00	95.26	28.57	0.00	83.51	70.00	25.00	100.00
Central Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bendasi	0.00	0.00	37.50	44.44	0.00	100.00	0.00	0.00	0.00
Nertiti	33.33	13.02	54.84	45.45	20.00	66.67	40.00	17.05	62.50
Azum	38.46	14.96	64.30	18.75	0.00	46.20	40.00	15.37	64.31
Um Dukhun	23.33	0.00	56.25	21.88	0.00	57.18	64.86	29.40	96.35
Central Darfur State	17.91	0.01	44.16	20.20	0.01	52.67	26.04	1.94	50.15

Spatial distribution of child consumption of iron-, calcium- and zinc-rich foods

Low rates of iron-, calcium- and zinc-rich foods consumption were evenly spread throughout Sudan, with pockets of high consumption rates throughout the country *(see Figure 104, Figure 106 and Figure 108)*.

FIGURE 104:
IYCF: Diet: Consumes iron-rich foods (raster)

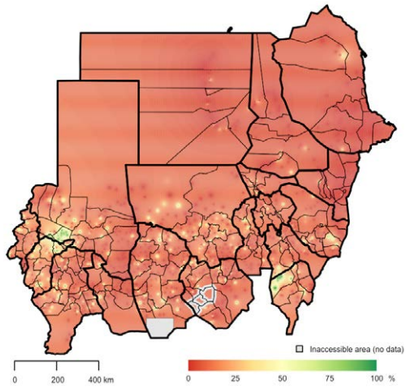


FIGURE 105:
IYCF: Diet: Consumes iron-rich foods

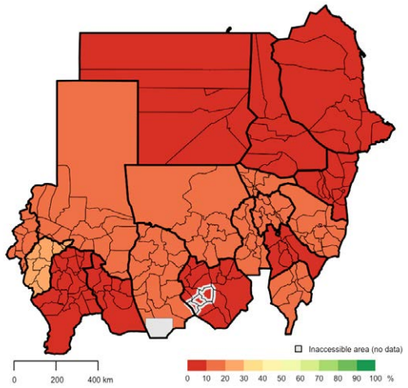


FIGURE 106:
IYCF: Diet: Consumes calcium-rich foods (raster)

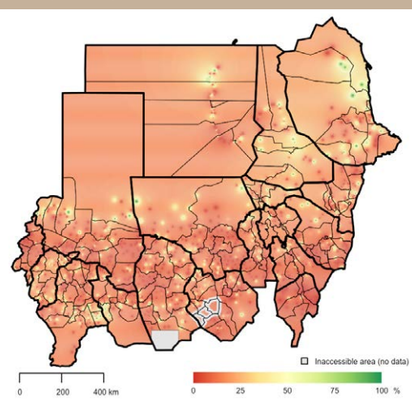


FIGURE 107:
IYCF: Diet: Consumes calcium-rich foods

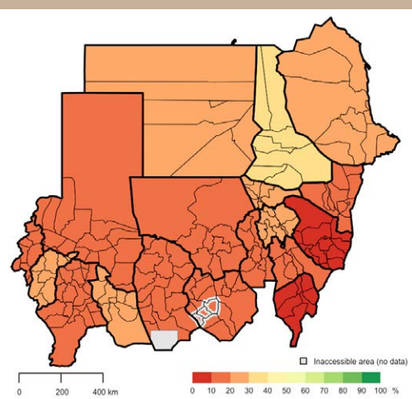


FIGURE 108:
IYCF: Diet: Consumes zinc-rich foods (raster)

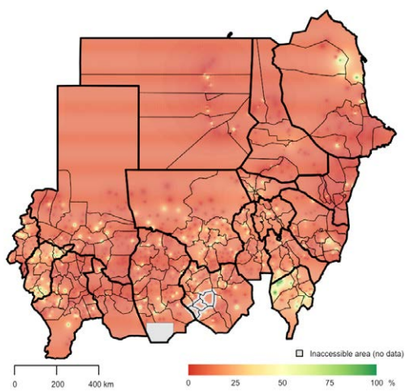
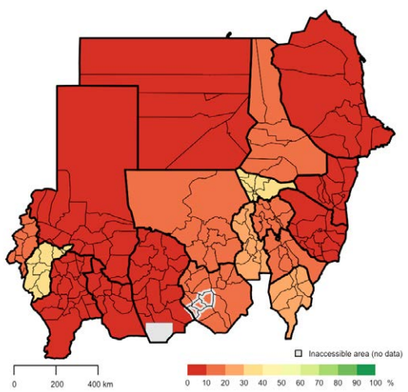


FIGURE 109:
IYCF: Diet: Consumes zinc-rich Foods

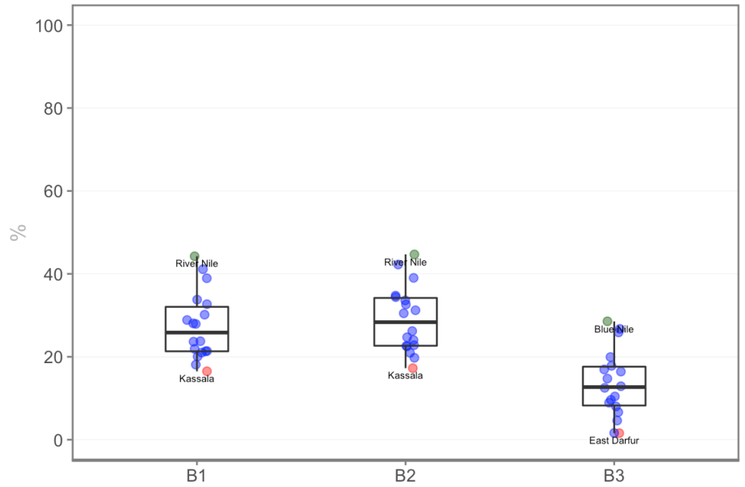


3.3.5 Child consumption of vitamin B-rich foods

Child consumption of vitamin B average results

Child consumption of vitamin B1-, B2- and B3-rich foods was low across Sudan at 28.8 per cent (95 per cent CI: 1.62-55.9 per cent), 30.7 per cent (95 per cent CI: 2.54-58.8 per cent) and 15.0 per cent (95 per cent CI: 0.01-34.8 per cent) respectively. At the state level, consumption of these vitamin B-rich foods was low, with very small inter-state variability *(see Figure 110)*.

FIGURE 110: Box plot of state results for child consumption of foods rich in vitamin B1, B2 and B3



At the locality level, there was high intra-state and inter-locality variability in the child consumption of vitamin B1-, B2- and B3-rich foods. About 82.7 per cent of localities had fewer than 50 per cent of children who consumed vitamin B1-rich foods, while 14.5 per cent of localities had no children who consumed vitamin B1-rich foods. About 82.7 per cent of localities had fewer than 50 per cent of children who consumed vitamin B2-rich foods, while 14 per cent of localities had no children who consumed vitamin B2-rich foods. About 93.5 per cent of localities had fewer than 50 per cent of children who consumed vitamin B3-rich foods, while 37.8 per cent of localities had no children who consumed vitamin B3-rich foods. Across localities, there was low child consumption of vitamin B1-, B2- and B3-rich foods *(see Figure 111)*.

Table 27 and Table 28 present results by locality, by state and at the national level for estimates of child consumption of vitamin B1, B2 and B3-rich foods.

FIGURE 111: Box plot of locality results for child consumption of foods rich in vitamins B1, B2 and B3

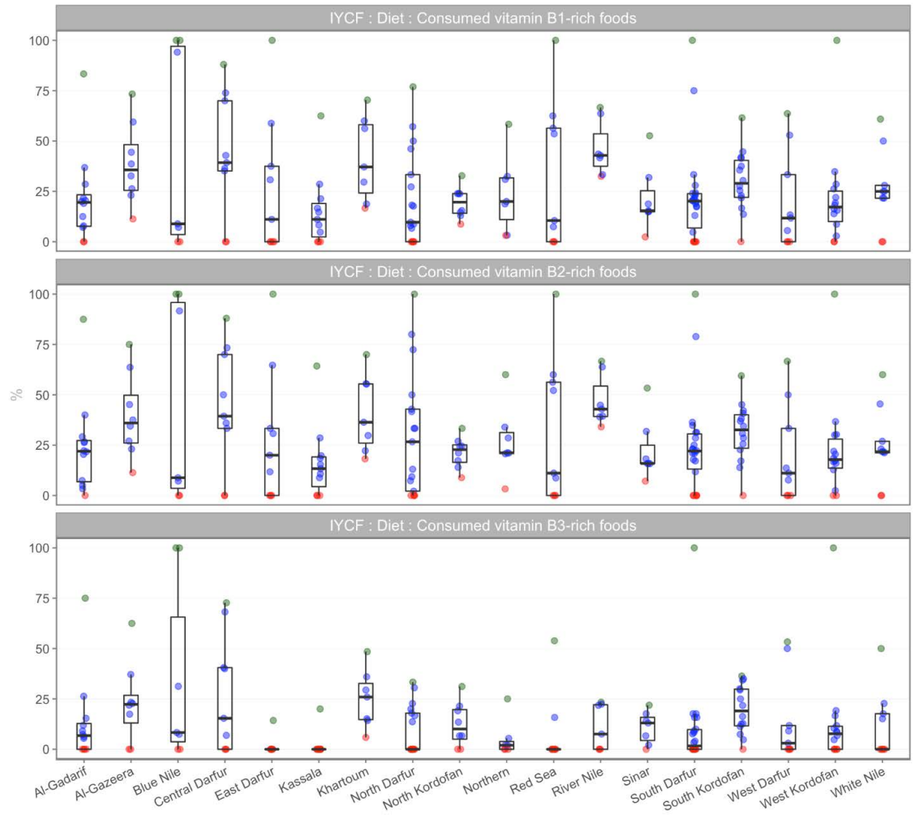


Table 27: Child consumption of vitamin B-rich foods by state and national

State	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	21.37	0.01	48.36	24.03	0.01	52.05	12.49	0.01	36.83
Al-Gazeera	32.68	4.33	61.04	33.59	5.77	61.41	16.96	0.01	41.04
Blue Nile	33.78	14.28	53.29	34.40	14.39	54.42	28.54	7.55	49.52
Central Darfur	38.96	7.58	70.34	39.04	6.06	72.03	25.86	1.35	50.36
East Darfur	21.02	0.01	50.35	22.62	0.01	54.79	1.59	0.01	14.60
Kassala	16.49	0.01	46.26	17.26	0.01	49.74	1.65	0.01	16.08
Khartoum	41.12	14.74	67.50	42.26	15.84	68.68	26.72	3.80	49.65
North Darfur	20.05	0.01	46.72	34.74	6.24	63.24	8.91	0.01	29.17
North Kordofan	21.93	5.94	37.92	22.55	7.14	37.95	14.75	3.05	26.45

Table 27: Child consumption of vitamin B-rich foods by state and national

State	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Northern	28.07	4.39	51.76	32.62	4.88	60.36	6.63	0.01	27.30
Red Sea	21.31	1.20	41.41	20.97	0.01	42.41	4.62	0.01	21.52
River Nile	44.26	23.01	65.51	44.71	22.23	67.20	9.60	0.01	19.30
Sennar	23.75	0.01	48.13	24.71	1.63	47.79	10.46	0.01	26.63
South Darfur	28.87	0.01	67.27	31.21	0.01	73.08	12.89	1.84	23.95
South Kordofan	30.15	6.39	53.92	30.50	6.59	54.40	19.94	0.01	40.02
West Darfur	23.64	0.01	56.42	22.80	0.01	54.61	16.42	0.01	43.25
West Kordofan	18.12	0.01	43.51	19.76	0.01	45.79	8.03	0.01	29.68
White Nile	27.94	2.76	53.11	26.20	0.42	51.99	17.83	0.01	37.77
Sudan	28.76	1.62	55.91	30.69	2.54	58.84	14.97	0.01	34.77

Table 28: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	40.00	15.99	66.71	40.43	14.67	68.14	5.26	0.00	19.31
El Golid	3.28	0.00	13.96	3.17	0.00	12.20	1.85	0.00	11.13
Merwoe	58.33	0.00	100.00	55.56	14.29	100.00	25.00	0.00	90.91
El Daba	3.12	0.00	22.24	20.00	4.91	44.02	0.00	0.00	0.00
Halfa	52.63	20.00	76.76	51.92	20.00	80.00	0.00	0.00	10.53
Delgo	21.62	5.25	44.20	20.93	6.06	48.72	7.89	0.00	24.01
El Burgaig	14.71	0.00	38.46	16.67	0.00	41.39	0.00	0.00	12.01
Northern State	28.07	4.39	51.76	32.62	4.88	60.36	6.63	0.01	27.30
El Matama	26.67	9.99	45.51	27.42	13.15	45.59	0.00	0.00	8.70
Shendi	34.00	17.78	50.00	38.46	23.28	54.77	7.50	0.00	20.03
Abu Hamad	35.00	5.87	68.02	31.82	7.14	62.58	0.00	0.00	0.00
Barbar	66.67	27.16	100.00	64.50	27.27	100.00	0.00	0.00	0.00
El Damar	59.55	43.19	74.01	57.65	43.46	74.61	21.92	12.04	32.90
Atbara	38.89	22.71	55.56	36.23	21.12	52.94	17.24	3.45	31.65
El Buhaira	40.32	22.80	60.98	41.51	26.31	63.53	20.69	9.71	35.20
River Nile State	44.26	23.01	65.51	44.71	22.23	67.20	9.60	0.01	19.30
Khartoum	50.00	26.82	77.82	50.00	22.22	78.59	34.78	13.62	66.75
Bahri	18.75	0.00	53.36	23.08	0.00	58.36	7.14	0.00	35.32

Table 28: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Um Durman	59.38	33.33	80.81	57.14	31.53	81.42	29.79	9.08	54.06
Um Bada	75.00	42.82	95.85	75.00	45.43	95.66	53.57	28.12	76.21
Jebel Awlia	15.15	0.00	43.76	16.00	0.00	42.94	11.76	0.00	39.37
Sharg Elneel	36.00	11.99	62.96	36.36	11.76	59.09	24.14	4.75	47.07
Karrari	39.29	13.73	69.05	37.93	8.32	70.86	18.52	0.00	42.90
Khartoum State	41.12	14.74	67.50	42.26	15.84	68.68	26.72	3.80	49.65
Greater Medani	37.50	14.62	60.00	34.29	13.31	56.29	21.57	5.87	44.84
Ganub Elgazira	27.78	5.87	60.00	27.59	5.26	60.06	0.00	0.00	15.38
El Hassahisa	36.00	11.09	62.27	41.94	15.94	71.07	18.18	0.00	39.13
El Kamlin	11.76	0.00	27.60	11.76	0.00	30.78	0.00	0.00	11.12
Sharg El Gezira	24.14	0.00	61.68	24.14	3.33	59.09	18.52	0.00	53.33
Um Elqura	NA	NA	NA	44.44	0.00	100.00	22.22	0.00	75.21
El Manaqil	40.91	18.41	70.83	41.94	20.00	69.25	27.27	3.33	53.86
El Qurashi	33.33	16.10	51.74	34.92	16.64	55.04	21.05	4.07	40.63
Al-Gazeera State	32.68	4.33	61.04	33.59	5.77	61.41	16.96	0.01	41.04
Sennar	28.89	4.84	54.29	28.57	5.83	53.14	19.05	0.00	37.94
Sharg Sennar	50.00	24.94	82.69	50.00	21.72	83.38	0.00	0.00	19.06
Sinja	15.25	6.05	25.58	15.62	6.33	27.61	14.52	6.14	24.53
Abu Hujar	19.35	0.00	50.00	21.21	0.00	48.36	19.23	0.00	46.17
El Dali	17.86	0.00	42.90	18.52	0.00	50.00	8.70	0.00	31.60
Es Suki	11.63	0.00	34.39	14.55	1.96	38.31	7.50	0.00	23.10
Ed Dinder	10.53	0.00	27.31	10.34	0.00	28.15	6.90	0.00	23.11
Sennar State	23.75	0.01	48.13	24.71	1.63	47.79	10.46	0.01	26.63
Ed Damazine	14.29	0.00	50.00	12.90	0.00	47.21	13.33	0.00	45.45
El Tadamon	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Roseiris	10.71	0.00	28.90	10.64	0.00	27.78	9.43	0.00	25.00
Baw	0.00	0.00	16.67	0.00	0.00	15.42	0.00	0.00	0.00
Geisan	83.33	42.57	100.00	84.62	50.00	100.00	33.33	0.00	81.97
El Kurmuk	100.00	0.00	100.00	100.00	0.00	100.00	100.00	0.00	100.00
Wad El Mahi	5.88	0.00	31.25	5.56	0.00	31.27	5.56	0.00	28.57
Blue Nile State	33.78	14.28	53.29	34.40	14.39	54.42	28.54	7.55	49.52
Kosti	24.24	7.88	46.75	24.39	7.66	42.91	20.83	4.32	39.41
Guli	30.77	6.67	59.10	29.17	3.80	60.10	0.00	0.00	20.00
Tendalti	22.73	0.00	58.42	8.33	0.00	40.08	0.00	0.00	0.00
Es Salam	0.00	0.00	11.76	0.00	0.00	10.56	0.00	0.00	0.00
Rabak	25.00	3.69	46.67	24.49	3.70	46.15	17.54	0.00	35.98
El Jabalain	29.17	0.00	64.31	28.00	0.00	63.70	28.57	0.00	61.93

Table 28: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Diwaim	59.26	33.33	82.67	58.33	28.57	86.36	50.00	27.24	78.81
Um Rimta	50.00	0.00	100.00	42.86	0.00	100.00	0.00	0.00	66.67
El Gitaina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White Nile State	27.94	2.76	53.11	26.20	0.42	51.99	17.83	0.01	37.77
Port Sudan	35.48	10.31	67.86	36.67	9.93	68.04	0.00	0.00	29.18
Swakin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
El Gonob Welawlaib	100.00	77.78	100.00	100.00	72.66	100.00	33.33	0.00	100.00
Sinkat	12.50	0.00	50.00	13.33	0.00	50.00	5.26	0.00	30.00
Haya	5.26	0.00	26.94	8.33	0.00	29.66	0.00	0.00	0.00
Dordieb	60.00	35.26	86.42	61.11	35.97	86.67	15.38	0.00	46.18
Tokar	2.17	0.00	16.24	0.00	0.00	20.00	0.00	0.00	0.00
Agig	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gabaot Elma-aadin	55.56	25.00	85.76	55.56	22.22	79.34	53.85	20.00	80.00
Halaeeb (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red Sea State	21.31	1.20	41.41	20.97	0.01	42.41	4.62	0.01	21.52
Kassala Town	0.00	0.00	33.33	0.00	0.00	40.50	0.00	0.00	0.00
Refi Kassla	14.81	0.00	44.53	15.15	0.00	50.00	0.00	0.00	26.32
Rural Western Kassala	21.11	11.67	32.98	21.52	11.89	32.12	0.00	0.00	5.01
New Halfa	15.22	1.70	38.10	13.33	0.00	35.01	0.00	0.00	12.56
Refi Nahr Atbara	25.00	0.00	100.00	28.57	0.00	100.00	0.00	0.00	0.00
Rural Khashm Elgirba	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00
Rural Wad Elhilaiw	4.76	0.00	19.66	11.11	0.00	31.06	0.00	0.00	0.00
Rural Aroma	17.14	5.40	34.40	17.24	5.24	33.91	0.00	0.00	0.00
Refi North Delta	10.00	0.00	28.57	8.70	0.00	30.77	0.00	0.00	0.00
Refi Hamashkureib	0.00	0.00	18.18	0.00	0.00	16.92	0.00	0.00	0.00
Rural Telkok	58.33	22.18	100.00	57.14	18.75	100.00	10.00	0.00	46.83
Kassala State	16.49	0.01	46.26	17.26	0.01	49.74	1.65	0.01	16.08
Gedaref Town	12.50	0.00	35.75	16.67	0.00	45.52	7.89	0.00	30.45
Middle Geddaref	22.22	0.00	83.33	20.00	0.00	100.00	7.14	0.00	54.44
Elbutana	40.00	0.00	75.00	38.89	0.00	80.00	11.76	0.00	43.75
El Fashaga	6.25	0.00	33.51	6.67	0.00	36.36	0.00	0.00	0.00
El Rahad	11.54	0.00	36.36	27.27	7.49	63.16	12.50	0.00	38.48
Gala-a El Nahal	0.00	0.00	0.00	5.26	0.00	23.37	0.00	0.00	0.00
El Fao	17.65	6.44	32.61	17.95	5.44	33.33	4.88	0.00	15.38
El Qureisha	0.00	0.00	45.45	0.00	0.00	50.00	0.00	0.00	0.00

Table 28: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Mafaza	20.00	0.00	55.59	21.43	0.00	57.14	11.76	0.00	42.19
Basunda	9.68	0.00	30.78	8.82	0.00	27.10	7.32	0.00	24.41
Western Galabat	20.00	3.69	40.00	20.83	3.96	40.06	6.25	0.00	21.76
Eastern Galabat	83.33	37.50	100.00	88.89	49.71	100.00	66.67	13.57	100.00
Al-Gadarif State	21.37	0.01	48.36	24.03	0.01	52.05	12.49	0.01	36.83
Sheikan	30.51	16.16	44.45	30.77	16.28	44.45	28.57	15.62	43.25
Um Rawaba	10.00	2.24	19.06	9.09	1.59	17.46	7.41	1.37	16.05
Um Dam Haj Ahmed	34.00	16.21	54.89	37.25	19.59	57.60	30.77	12.17	51.73
El Rahad	16.67	0.00	35.72	17.39	0.00	38.00	0.00	0.00	10.71
Bara	24.00	9.60	40.48	22.58	8.62	37.73	18.75	6.51	32.81
Gharb Bara	23.26	7.40	41.19	24.00	8.93	46.60	11.32	1.88	22.95
Soudari	20.63	6.24	40.30	23.64	8.90	41.18	9.26	1.72	23.12
Gebrat El Sheikh	19.23	5.26	36.36	18.75	6.45	38.10	1.72	0.00	9.43
North Kordofan State	21.93	5.94	37.92	22.55	7.14	37.95	14.75	3.05	26.45
Kadugli	43.90	26.32	62.09	43.48	26.91	61.91	34.09	15.02	52.52
Reif Shargi	24.07	4.86	48.24	23.64	6.96	46.16	12.50	1.96	25.00
Dilling	36.00	4.76	69.27	35.00	7.14	66.90	33.33	4.73	69.63
El Quoz	29.79	12.17	47.92	35.71	17.77	55.10	18.18	7.00	32.65
Habila	31.15	17.12	46.55	32.00	18.96	46.94	4.55	0.00	18.61
Abassiya	28.57	8.00	54.21	27.78	8.56	54.68	6.52	0.00	25.00
El Rashad	37.50	12.43	67.69	37.50	13.29	69.23	35.48	10.50	66.67
Abu Jubaiha	22.73	4.00	60.04	23.08	4.99	55.63	19.05	3.01	50.11
El Tadamon	13.51	2.55	27.92	14.29	2.56	27.78	10.20	0.00	22.24
Talodi	20.83	0.00	50.00	21.74	0.00	50.17	21.43	0.00	50.00
Ghadeer	0.00	0.00	12.91	0.00	0.00	11.11	0.00	0.00	0.00
El Leri	15.38	4.07	30.97	15.56	3.12	33.33	3.39	0.00	16.13
Abu Karshola	60.98	30.72	88.48	57.69	31.99	89.47	33.33	10.80	57.89
Delami	31.25	0.00	60.08	31.58	6.67	61.54	29.63	0.00	57.14
South Kordofan State	30.15	6.39	53.92	30.50	6.59	54.40	19.94	0.01	40.02
Abu Zabad	18.18	2.44	39.42	14.29	3.01	34.29	3.12	0.00	16.69
ElKhiwai	27.78	0.00	64.03	29.03	3.52	60.00	0.00	0.00	17.67
Ghubaish	14.29	2.48	29.41	13.79	3.44	27.82	7.55	0.00	22.24
El Nuhud	14.63	2.70	31.14	20.69	5.15	40.02	3.77	0.00	13.97
El Idia	14.29	0.00	32.37	20.00	4.88	37.52	6.38	0.00	20.60
Wad Benda	19.05	7.35	39.73	19.44	5.88	42.31	9.62	1.27	24.54
Lagawa	34.78	15.30	58.36	36.00	13.04	63.16	11.76	0.00	28.57

Table 28: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Elsunut	28.12	9.08	54.20	27.27	7.98	50.00	10.20	0.00	28.95
Keilik	0.00	0.00	20.00	0.00	0.00	18.21	0.00	0.00	14.29
Es Salam	24.29	11.83	42.59	30.56	15.27	48.94	17.91	5.78	30.69
Babanusa	8.51	0.00	26.76	8.89	0.00	29.74	0.00	0.00	10.81
Abyei	14.29	0.00	55.63	16.67	0.00	57.29	15.79	0.00	55.78
El Dibab	40.00	0.00	100.00	40.00	0.00	100.00	40.00	0.00	100.00
El Meiram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
West Kordofan State	18.12	0.01	43.51	19.76	0.01	45.79	8.03	0.01	29.68
El Fasher	14.29	0.00	36.42	28.57	7.13	55.56	10.64	0.00	33.38
Tawila	20.00	0.00	64.52	44.44	0.00	100.00	17.65	0.00	57.14
Melit	40.00	7.64	68.42	40.00	8.33	75.00	21.43	0.00	50.12
Um Kadada	0.00	0.00	14.29	0.00	0.00	14.73	0.00	0.00	11.11
Kebkabiya	9.68	0.00	27.30	100.00	100.00	100.00	0.00	0.00	10.54
Kutum	50.00	0.00	100.00	30.77	0.00	100.00	28.57	0.00	100.00
El Mahalha	41.67	0.00	88.89	44.44	6.25	85.71	0.00	0.00	0.00
Saraf Omra	18.18	0.00	40.95	65.38	33.33	92.87	16.67	0.00	38.25
El Serief	5.26	0.00	23.10	5.56	0.00	18.52	0.00	0.00	0.00
Dar Elsalam	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kelemando	21.05	0.00	55.06	21.43	0.00	54.55	11.11	0.00	47.21
El Tawisha	8.62	0.00	20.51	9.26	0.00	25.00	0.00	0.00	0.00
Um Baru	67.86	18.72	100.00	68.75	25.00	100.00	15.00	0.00	36.84
El Lait	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ELkuma	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00
El Tina	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kernoi	32.14	16.64	55.03	31.58	14.93	53.11	20.93	6.66	36.65
North Darfur State	20.05	0.01	46.72	34.74	6.24	63.24	8.91	0.01	29.17
Nyala South	17.78	3.97	33.33	16.98	4.75	32.69	4.08	0.00	17.04
Nyala North	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Es Salam	0.00	0.00	16.67	0.00	0.00	17.45	0.00	0.00	11.56
El Wihda	0.00	0.00	14.31	0.00	0.00	22.74	0.00	0.00	0.00
Mershing	17.14	0.00	39.32	22.86	5.39	44.46	3.77	0.00	18.81
Beliel	21.05	0.00	48.24	22.58	4.35	52.69	16.67	0.00	41.67
Nitega	12.50	0.00	31.93	33.33	9.05	69.31	0.00	0.00	0.00
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	5.13	0.00	20.00	11.43	0.00	28.57	0.00	0.00	3.45
Shattaya	23.08	6.22	40.00	24.59	5.55	44.79	4.65	0.00	20.02

Table 28: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

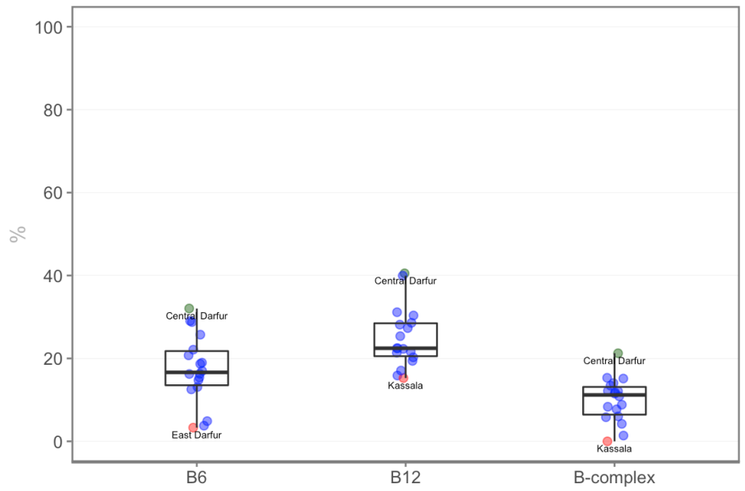
Location	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Buram	25.93	2.97	60.08	33.33	9.04	69.59	8.33	0.00	30.81
Gereida	21.43	0.00	60.00	21.74	0.00	62.52	0.00	0.00	0.00
El Sunta	50.00	11.68	91.67	50.00	9.09	91.67	19.05	0.00	50.15
El Radoum	30.00	7.14	60.13	30.56	7.48	60.13	21.88	0.00	50.00
Tulus	84.52	0.00	100.00	77.78	0.00	100.00	0.00	0.00	0.00
Damso	20.00	0.00	100.00	24.04	0.00	100.00	0.00	0.00	0.00
Ed Elfursan	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Kubum	20.29	8.72	31.77	20.25	8.00	32.54	15.71	4.60	26.99
Kateila	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rehaid Elbirdi	24.56	11.28	39.30	31.67	17.13	46.36	10.53	1.78	24.08
Um Dafoug	17.95	2.94	36.12	17.95	3.70	37.06	8.20	0.00	23.08
South Darfur State	28.87	0.01	67.27	31.21	0.01	73.08	12.89	1.84	23.95
Abu Jabra	37.50	0.00	75.00	33.33	0.00	75.75	0.00	0.00	0.00
Abu Karinka	9.09	0.00	67.14	10.00	0.00	71.88	0.00	0.00	0.00
Bahr El Arab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adila	31.25	6.64	66.67	31.58	8.66	66.67	0.00	0.00	0.00
Ed Dain	33.33	0.00	83.51	33.33	0.00	75.47	12.50	0.00	58.33
Assalaya	11.76	0.00	40.08	12.50	0.00	42.86	0.00	0.00	18.81
El Firdous	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
Shia-ria	0.00	0.00	42.86	0.00	0.00	36.42	0.00	0.00	38.94
Yassin	0.00	0.00	50.00	25.00	0.00	100.00	0.00	0.00	0.00
East Darfur State	21.02	0.01	50.35	22.62	0.01	54.79	1.59	0.01	14.60
El Geneina	13.79	0.00	38.90	15.38	0.00	42.17	11.76	0.00	34.63
Habila	3.94	0.00	43.80	4.55	0.00	50.00	0.00	0.00	0.00
Kulbus	33.33	0.00	75.10	33.33	0.00	80.00	11.11	0.00	60.00
Beida	62.50	14.20	100.00	61.54	21.81	100.00	50.00	9.95	100.00
Foro Baranga	14.29	0.00	50.00	15.38	0.00	42.86	0.00	0.00	0.00
Kereneik	3.33	0.00	17.39	4.35	0.00	19.24	3.85	0.00	17.26
Sirba	42.86	6.67	81.25	42.86	11.11	100.00	42.86	14.20	80.00
Jebel Moon	25.00	0.00	77.84	21.58	0.00	66.67	14.29	0.00	50.28
West Darfur State	23.64	0.01	56.42	22.80	0.01	54.61	16.42	0.01	43.25
Zalingi	40.00	18.75	62.53	37.21	14.27	60.00	17.39	3.03	40.00
Wadi Salih	36.36	0.00	91.00	38.10	0.00	88.94	16.67	0.00	50.00
Mukjar	71.43	17.60	100.00	68.42	0.00	100.00	70.00	25.00	100.00
Central Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bendasi	NA	NA	NA	NA	NA	NA	0.00	0.00	0.00

Table 28: Child consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nertiti	68.29	34.97	88.24	68.09	41.15	89.66	38.46	17.38	63.37
Azum	40.00	16.67	62.53	40.00	15.77	63.38	40.00	18.16	63.21
Um Dukhun	88.00	59.89	100.00	87.50	57.10	100.00	63.33	31.23	100.00
Central Darfur State	38.96	7.58	70.34	39.04	6.06	72.03	25.86	1.35	50.36

Child consumption of vitamin B6-, B12- and B-complex-rich foods was low at 18.8 per cent (95 per cent CI: 0.01-41.1 per cent), 25.8 per cent (95 per cent CI: 0.01-53.8 per cent), and 11.0 per cent (95 per cent CI: 0.01-30.4 per cent) respectively. At the state level, consumption of these vitamin B-rich foods was low, with very small inter-state variability *(see Figure 112)*.

FIGURE 112: Box plot of state results for child consumption of foods rich in vitamin B6, B12 and B-complex



At the locality level, there was high intra-state and inter-locality variability in the child consumption of vitamin B6-, B12- and B-complex-rich foods. About 92.4 per cent of localities had fewer than 50 per cent of children who consumed vitamin B6-rich foods, while 27 per cent of localities had no children who consumed vitamin B6-rich foods. About 84.8 per cent of localities had fewer than 50 per cent of children who consumed vitamin B12-rich foods, while 16.7 per cent of localities had no children who consumed vitamin B12-rich foods. About 95.1 per cent of localities had fewer than 50 per cent of children who consumed vitamin B-complex-rich foods, while 44.3 per cent of localities had no children who consumed vitamin B-complex-rich foods. Across localities, there was low child consumption of vitamin B6-, B12- and B-complex-rich foods *(see Figure 113)*.

Table 29 and Table 30 present results by locality, by state and at the national level for estimates of child consumption of vitamin B6-, B12- and B-complex-rich foods.

FIGURE 113: Box plot of locality results for child consumption of foods rich in vitamin B6, B12 and B-complex

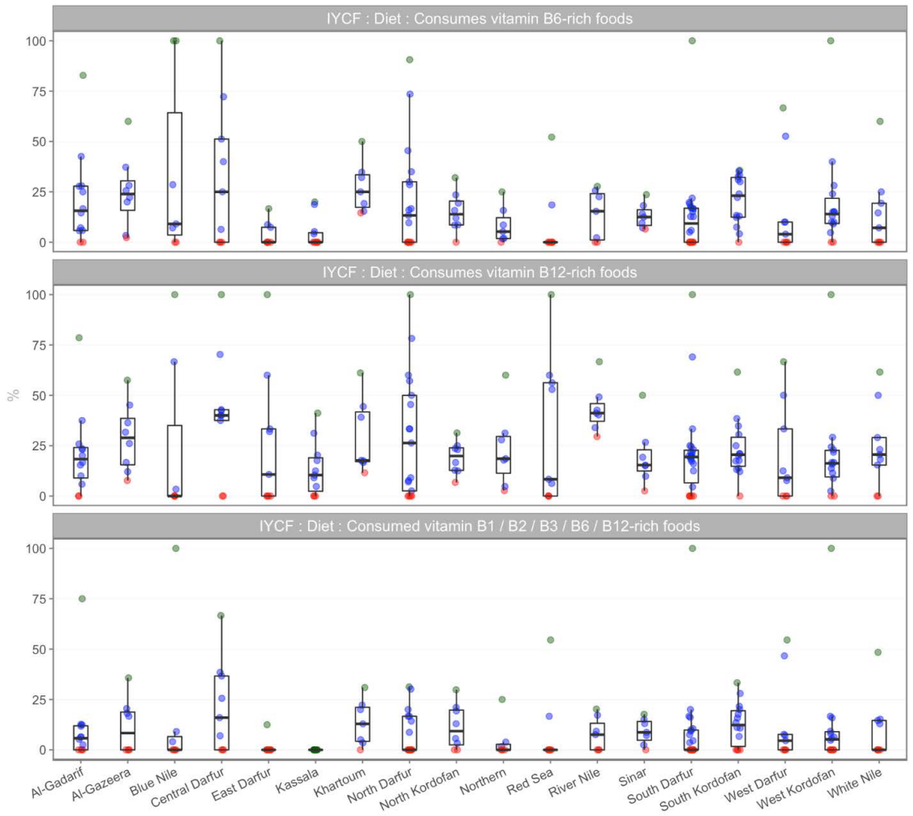


Table 29: Child consumption of vitamin B-rich foods by state and national

State	Vitamin B6-rich foods %			Vitamin B12-rich foods %			Vitamin B complex-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	22.12	0.01	54.17	21.63	0.01	50.10	12.15	0.01	34.78
Al-Gazeera	18.69	0.01	42.17	28.59	0.58	56.60	11.53	0.01	30.81
Blue Nile	28.78	6.35	51.21	15.89	0.01	31.80	10.86	0.01	24.55
Central Darfur	32.04	12.41	51.66	40.53	10.02	71.04	33.39	9.47	57.31
East Darfur	3.30	0.01	25.90	22.44	0.01	49.06	1.39	0.01	14.67

Table 29: Child consumption of vitamin B-rich foods by state and national

State	Vitamin B6-rich foods %			Vitamin B12-rich foods %			Vitamin B complex-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kassala	3.78	0.01	29.96	15.26	0.01	46.01	0.00	0.00	3.32
Khartoum	29.03	6.30	51.75	30.37	5.33	55.42	15.15	0.01	36.56
North Darfur	25.73	0.52	50.95	31.15	3.13	59.17	8.35	0.01	28.02
North Kordofan	16.98	3.51	30.45	20.27	5.08	35.45	13.45	1.87	25.03
Northern	12.54	0.01	34.09	27.31	0.61	54.02	6.02	0.01	26.35
Red Sea	4.88	0.01	21.89	19.41	0.58	38.23	4.22	0.01	19.97
River Nile	14.75	3.65	25.85	39.96	18.58	61.33	5.82	0.01	14.65
Sennar	13.12	0.01	32.30	21.36	0.01	44.63	8.84	0.01	24.46
South Darfur	16.30	0.01	33.26	28.15	0.01	75.40	11.81	0.01	38.81
South Kordofan	20.74	0.44	41.05	22.48	1.74	43.23	12.12	0.01	29.47
West Darfur	16.24	0.01	42.81	22.31	0.01	53.56	14.06	0.01	39.02
West Kordofan	15.42	0.01	42.44	17.08	0.01	41.81	7.73	0.01	30.40
White Nile	18.98	0.01	39.76	25.38	0.01	51.67	15.32	0.01	34.83
Sudan	18.83	0.01	41.10	25.78	0.01	53.77	11.02	0.01	30.41

Table 30: Child consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B6-rich foods %			Vitamin B12-rich foods %			Vitamin B complex-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	7.32	0.00	21.88	37.50	16.65	64.71	3.57	0.00	14.82
El Golid	1.96	0.00	10.79	2.90	0.00	13.49	1.61	0.00	8.96
Merwoe	25.00	0.00	77.01	55.56	12.50	90.50	23.53	0.00	85.71
El Daba	15.00	2.49	36.01	2.70	0.00	21.07	0.00	0.00	0.00
Halfa	3.57	0.00	18.54	51.22	18.71	76.19	0.00	0.00	12.01
Delgo	8.82	0.00	23.70	15.79	1.73	36.39	2.17	0.00	11.80
El Burgaig	10.71	0.00	31.06	13.33	0.00	38.54	0.00	0.00	0.00
Northern State	12.54	0.01	34.09	27.31	0.61	54.02	6.02	0.01	26.35
El Matama	2.08	0.00	13.34	25.35	10.63	43.14	0.00	0.00	0.00
Shendi	15.15	4.08	33.33	33.33	17.38	56.04	7.14	0.00	22.86
Abu Hamad	0.00	0.00	0.00	37.50	9.04	70.60	0.00	0.00	0.00
Barbar	0.00	0.00	0.00	66.67	25.00	100.00	0.00	0.00	0.00
El Damar	31.30	19.22	43.69	45.98	31.64	62.79	8.05	1.39	16.38
Atbara	20.55	6.51	33.83	36.11	20.40	52.38	14.52	2.08	26.93

Table 30: Child consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B6-rich foods %			Vitamin B12-rich foods %			Vitamin B complex-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Buhaira	22.54	10.44	37.51	38.57	20.46	63.17	15.49	5.35	29.81
River Nile State	14.75	3.65	25.85	39.96	18.58	61.33	5.82	0.01	14.65
Khartoum	34.48	11.11	64.72	40.00	17.12	73.35	23.08	3.70	52.03
Bahri	18.18	0.00	50.00	18.75	0.00	50.00	6.67	0.00	37.50
Um Durman	32.00	13.15	56.81	61.29	35.69	84.40	30.30	11.11	52.18
Um Bada	55.00	31.96	79.00	50.00	26.30	72.73	30.00	7.39	55.56
Jebel Awlia	15.00	0.00	46.21	15.38	0.00	41.26	11.54	0.00	38.15
Sharg Elneel	25.00	5.85	50.10	12.00	0.00	38.46	0.00	0.00	15.16
Karrari	16.67	0.00	42.96	25.00	3.06	61.80	5.56	0.00	23.09
Khartoum State	29.03	6.30	51.75	30.37	5.33	55.42	15.15	0.01	36.56
Greater Medani	21.43	3.44	39.13	32.14	9.08	53.69	15.00	0.00	33.33
Ganub Elgazira	0.00	0.00	20.00	27.27	5.26	57.14	0.00	0.00	16.67
El Hassahisa	21.57	6.04	41.68	30.77	7.47	59.30	11.90	0.00	34.29
El Kamlin	1.45	0.00	18.44	10.71	0.00	28.64	0.00	0.00	9.62
Sharg El Gezira	20.69	3.44	52.94	10.00	0.00	36.42	0.00	0.00	28.57
Um Elqura	25.00	0.00	76.00	40.00	0.00	87.60	10.82	0.00	66.67
El Manaqil	26.32	5.23	55.66	39.13	15.99	66.67	24.14	4.97	50.09
El Qurashi	26.67	8.70	47.66	32.56	16.67	50.00	20.00	3.70	40.56
Al-Gazeera State	18.69	0.01	42.17	28.59	0.58	56.60	11.53	0.01	30.81
Sennar	21.88	3.23	42.45	22.58	0.00	47.73	13.21	0.00	35.94
Sharg Sennar	9.09	0.00	37.57	47.37	18.18	80.00	0.00	0.00	0.00
Sinja	14.49	5.66	24.34	10.00	2.81	20.29	8.51	1.45	17.58
Abu Hujar	18.92	0.00	45.47	20.00	0.00	47.83	19.23	0.00	43.34
El Dali	9.09	0.00	29.55	18.92	0.00	50.00	8.33	0.00	27.27
Es Suki	9.76	0.00	25.95	11.54	0.00	35.14	6.25	0.00	21.31
Ed Dinder	5.88	0.00	23.60	10.00	0.00	28.08	6.45	0.00	23.34
Sennar State	13.12	0.01	32.30	21.36	0.01	44.63	8.84	0.01	24.46
Ed Damazine	13.33	0.00	45.49	0.00	0.00	14.31	0.00	0.00	14.32
El Tadamon	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Roseiris	10.00	0.00	25.55	6.82	0.00	22.63	4.88	0.00	17.40
Baw	0.00	0.00	0.00	0.00	0.00	15.40	0.00	0.00	0.00
Geisan	33.33	0.00	83.45	63.64	22.22	100.00	15.38	0.00	55.56
El Kurmuk	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Wad El Mahi	5.88	0.00	30.79	0.00	0.00	0.00	0.00	0.00	0.00
Blue Nile State	28.78	6.35	51.21	15.89	0.01	31.80	10.86	0.01	24.55
Kosti	20.83	5.18	43.48	20.93	3.69	40.63	16.67	0.00	34.91

Table 30: Child consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B6-rich foods %			Vitamin B12-rich foods %			Vitamin B complex-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Guli	0.00	0.00	16.67	27.78	5.87	58.36	0.00	0.00	15.68
Tendalti	0.00	0.00	14.29	26.09	0.00	57.23	0.00	0.00	0.00
Es Salam	0.00	0.00	0.00	0.00	0.00	11.76	0.00	0.00	0.00
Rabak	17.65	0.00	36.86	22.58	0.00	48.29	15.79	0.00	33.33
El Jabalain	30.00	0.00	66.83	15.38	0.00	46.18	15.00	0.00	50.00
El Diwaim	57.14	30.00	85.71	58.33	29.95	82.24	50.00	23.32	75.00
Um Rimta	0.00	0.00	55.09	NA	NA	NA	0.00	0.00	55.75
El Gitaina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White Nile State	18.98	0.01	39.76	25.38	0.01	51.67	15.32	0.01	34.83
Port Sudan	0.00	0.00	28.57	35.00	12.46	66.67	0.00	0.00	26.71
Swakin	0.00	0.00	0.00	0.00	0.00	7.72	0.00	0.00	0.00
El Gonob Welawlaib	33.33	0.00	92.88	100.00	70.00	100.00	33.33	0.00	100.00
Sinkat	4.55	0.00	33.33	4.55	0.00	40.00	0.00	0.00	0.00
Haya	0.00	0.00	0.00	8.70	0.00	31.27	0.00	0.00	0.00
Dordieb	18.18	0.00	50.00	60.00	36.63	82.40	16.67	0.00	47.63
Tokar	0.00	0.00	0.00	1.92	0.00	18.20	0.00	0.00	0.00
Agig	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gabaot Elma-aadin	54.07	23.01	80.00	55.00	21.36	87.57	54.17	19.82	82.66
Halaeeb (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red Sea State	4.88	0.01	21.89	19.41	0.58	38.23	4.22	0.01	19.97
Kassala Town	0.00	0.00	0.00	0.00	0.00	45.14	0.00	0.00	0.00
Refi Kassla	3.33	0.00	46.23	15.38	0.00	52.67	0.00	0.00	26.67
Rural Western Kassala	0.00	0.00	4.82	21.59	10.94	34.12	0.00	0.00	5.35
New Halfa	0.00	0.00	11.54	12.12	0.00	35.00	0.00	0.00	0.00
Refi Nahr Atbara	20.00	0.00	100.00	33.33	0.00	100.00	0.00	0.00	0.00
Rural Khashm Elgirba	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00
Rural Wad Elhilaiw	5.71	0.00	24.05	5.00	0.00	20.85	0.00	0.00	0.00
Rural Aroma	0.00	0.00	9.38	17.02	4.75	32.61	0.00	0.00	0.00
Refi North Delta	0.00	0.00	0.00	10.00	0.00	30.45	0.00	0.00	0.00
Refi Hamashkureib	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00
Rural Telkok	11.11	0.00	50.00	44.44	8.30	87.63	0.00	0.00	0.00
Kassala State	3.78	0.01	29.96	15.26	0.01	46.01	0.00	0.00	3.32
Gedaref Town	18.18	0.00	44.02	14.29	0.00	40.19	7.41	0.00	28.61
Middle Geddaref	16.67	0.00	100.00	22.22	0.00	100.00	7.14	0.00	50.00

Table 30: Child consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B6-rich foods %			Vitamin B12-rich foods %			Vitamin B complex-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Elbutana	10.00	0.00	42.86	37.50	0.00	72.73	11.11	0.00	42.86
El Fashaga	0.00	0.00	0.00	5.88	0.00	37.50	0.00	0.00	0.00
El Rahad	41.38	11.41	89.47	24.00	2.76	59.21	11.11	0.00	36.84
Gala-a El Nahal	11.76	0.00	41.69	0.00	0.00	6.69	0.00	0.00	0.00
El Fao	6.90	0.00	20.53	19.51	7.13	34.63	4.84	0.00	16.67
El Qureisha	23.53	0.00	71.43	0.00	0.00	45.49	0.00	0.00	0.00
El Mafaza	17.86	0.00	43.82	12.50	0.00	58.46	4.35	0.00	23.08
Basunda	17.95	0.00	42.86	11.54	0.00	32.54	7.14	0.00	23.55
Western Galabat	6.52	0.00	20.00	17.65	0.00	37.16	2.70	0.00	15.83
Eastern Galabat	66.67	0.00	100.00	83.33	32.62	100.00	61.11	0.00	100.00
Al-Gadarif State	22.12	0.01	54.17	21.63	0.01	50.10	12.15	0.01	34.78
Sheikan	28.57	14.26	42.13	28.85	13.74	44.20	26.92	13.15	43.11
Um Rawaba	8.14	1.29	18.10	7.79	0.00	17.89	5.17	0.00	14.76
Um Dam Haj Ahmed	33.33	14.00	52.02	26.53	12.49	44.24	22.45	10.71	40.63
El Rahad	5.00	0.00	20.03	15.38	0.00	37.51	0.00	0.00	8.70
Bara	18.60	5.53	35.23	22.95	10.62	37.79	19.12	5.87	32.76
Gharb Bara	14.29	4.45	28.61	22.73	6.96	41.28	10.42	0.00	21.48
Soudari	14.29	3.06	32.63	19.64	6.66	38.82	6.82	0.00	18.04
Gebrat El Sheikh	5.17	0.00	15.01	17.65	6.00	36.43	1.79	0.00	9.11
North Kordofan State	16.98	3.51	30.45	20.27	5.08	35.45	13.45	1.87	25.03
Kadugli	35.71	15.13	54.60	34.21	16.21	54.86	24.24	7.98	47.53
Reif Shargi	12.82	2.04	25.68	11.54	0.00	27.70	0.00	0.00	2.27
Dilling	35.29	0.00	71.43	11.11	0.00	44.72	10.00	0.00	42.14
El Quoz	24.56	9.30	42.87	27.45	11.32	45.68	17.07	5.26	30.77
Habila	4.76	0.00	16.68	31.11	17.24	45.46	4.62	0.00	15.92
Abassiya	7.14	0.00	23.54	22.73	7.67	46.15	0.00	0.00	11.83
El Rashad	35.29	7.66	69.62	21.74	0.00	53.44	16.67	0.00	47.50
Abu Jubaiha	20.00	0.00	50.13	12.12	0.00	43.92	8.00	0.00	33.54
El Tadamon	10.81	0.00	22.97	13.89	2.77	27.60	11.43	2.49	21.31
Talodi	21.05	0.00	50.00	20.00	0.00	45.45	20.00	0.00	47.35
Ghadeer	0.00	0.00	0.00	0.00	0.00	13.64	0.00	0.00	0.00
El Leri	3.85	0.00	19.51	13.89	2.62	30.82	0.00	0.00	11.56
Abu Karshola	33.33	12.12	57.70	60.71	27.49	89.66	33.33	15.00	57.18
Delami	27.27	6.67	60.06	17.65	0.00	52.26	16.67	0.00	50.00

Table 30: Child consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B6-rich foods %			Vitamin B12-rich foods %			Vitamin B complex-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Kordofan State	20.74	0.44	41.05	22.48	1.74	43.23	12.12	0.01	29.47
Abu Zabad	12.50	0.00	29.63	17.78	2.86	41.32	3.03	0.00	14.74
ElKhiwai	23.53	4.16	48.24	28.57	4.55	57.94	0.00	0.00	17.40
Ghubaish	7.69	0.00	22.58	14.06	4.74	29.73	8.33	0.00	24.05
El Nuhud	11.36	0.00	28.28	14.29	3.33	31.41	3.85	0.00	14.73
El Idia	14.63	3.03	30.30	12.50	0.00	30.31	6.12	0.00	19.59
Wad Benda	15.25	4.76	31.71	14.49	2.99	30.03	6.12	0.00	22.26
Lagawa	12.50	0.00	38.49	23.08	3.84	48.01	0.00	0.00	12.50
Elsunut	12.50	0.00	36.05	27.03	7.88	48.28	9.62	0.00	29.63
Keilik	0.00	0.00	16.67	0.00	0.00	17.87	0.00	0.00	13.07
Es Salam	28.38	14.07	45.48	23.26	11.24	39.24	15.28	5.26	28.34
Babanusa	4.76	0.00	17.66	9.30	0.00	27.80	0.00	0.00	11.16
Abyei	40.00	0.00	87.57	16.67	0.00	50.23	18.75	0.00	63.79
El Dibab	40.00	0.00	100.00	40.00	0.00	100.00	42.86	0.00	100.00
El Meiram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
West Kordofan State	15.42	0.01	42.44	17.08	0.01	41.81	7.73	0.01	30.40
El Fasher	25.45	5.12	51.72	15.69	0.00	38.15	11.43	0.00	34.96
Tawila	42.86	0.00	100.00	46.15	0.00	100.00	18.18	0.00	50.00
Melit	16.67	0.00	52.96	30.77	5.00	66.67	7.69	0.00	33.33
Um Kadada	0.00	0.00	10.56	0.00	0.00	14.83	0.00	0.00	11.76
Kebkabiya	90.32	72.96	100.00	100.00	87.47	100.00	0.00	0.00	0.00
Kutum	31.58	0.00	90.05	52.94	0.00	100.00	30.77	0.00	100.00
El Mahalha	0.00	0.00	0.00	42.86	0.00	91.67	0.00	0.00	0.00
Saraf Omra	68.18	36.32	96.55	58.06	28.93	83.33	17.95	0.00	40.00
El Serief	0.00	0.00	0.00	5.13	0.00	18.04	0.00	0.00	0.00
Dar Elsalam	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kelemando	11.11	0.00	44.44	20.00	0.00	53.39	11.11	0.00	44.58
El Tawisha	16.00	3.02	30.24	9.09	0.00	20.36	0.00	0.00	0.00
Um Baru	30.77	5.00	58.33	66.67	23.07	100.00	14.81	0.00	37.50
El Lait	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ELkuma	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00
El Tina	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kernoi	21.62	4.98	38.74	32.39	15.93	52.95	21.95	4.14	37.51
North Darfur State	25.73	0.52	50.95	31.15	3.13	59.17	8.35	0.01	28.02

Table 30: Child consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B6-rich foods %			Vitamin B12-rich foods %			Vitamin B complex-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nyala South	14.29	3.12	27.08	17.39	5.25	34.18	4.65	0.00	15.79
Nyala North	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Es Salam	0.00	0.00	14.31	0.00	0.00	15.15	0.00	0.00	13.79
El Wihda	0.00	0.00	15.05	0.00	0.00	16.74	0.00	0.00	0.00
Mershing	13.64	0.00	31.03	21.88	0.00	47.09	3.77	0.00	18.43
Beliel	16.67	0.00	41.67	23.08	3.57	53.33	16.67	0.00	42.86
Nitega	19.23	3.20	50.15	12.50	0.00	31.82	0.00	0.00	0.00
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	5.13	0.00	20.60	5.13	0.00	20.03	0.00	0.00	5.97
Shattaya	6.00	0.00	24.14	23.08	6.65	41.47	4.00	0.00	17.78
Buram	17.86	0.00	43.93	16.67	0.00	43.34	0.00	0.00	0.00
Gereida	0.00	0.00	14.29	21.05	0.00	58.42	0.00	0.00	0.00
El Sunta	17.65	0.00	46.18	50.00	7.12	90.98	18.18	0.00	50.00
El Radoum	21.43	3.56	50.00	19.23	0.00	44.47	9.52	0.00	27.79
Tulus	0.00	0.00	0.00	85.71	0.00	100.00	0.00	0.00	0.00
Damso	0.00	0.00	100.00	25.00	0.00	100.00	0.00	0.00	0.00
Ed Elfursan	100.00	100.00	100.00	100.00	0.00	100.00	100.00	0.00	100.00
Kubum	17.24	4.40	28.73	20.00	8.89	32.29	16.05	6.24	26.86
Kateila	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rehaid Elbirdi	18.64	7.25	33.38	23.73	10.20	40.74	10.20	1.64	22.73
Um Dafoug	16.67	3.57	36.39	18.42	4.76	37.50	8.62	0.00	23.53
South Darfur State	16.30	0.01	33.26	28.15	0.01	75.40	11.81	0.01	38.81
Abu Jabra	0.00	0.00	0.00	35.71	0.00	80.33	0.00	0.00	0.00
Abu Karinka	0.00	0.00	0.00	11.11	0.00	80.00	0.00	0.00	0.00
Bahr El Arab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adila	0.00	0.00	0.00	30.00	8.00	62.56	0.00	0.00	0.00
Ed Dain	12.50	0.00	50.00	33.33	0.00	80.00	13.64	0.00	54.60
Assalaya	9.52	0.00	36.42	11.76	0.00	40.00	0.00	0.00	18.21
El Firdous	0.00	0.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
Shia-ria	0.00	0.00	35.75	0.00	0.00	40.00	0.00	0.00	33.33
Yassin	16.67	0.00	100.00	0.00	0.00	66.67	0.00	0.00	0.00
East Darfur State	3.30	0.01	25.90	22.44	0.01	49.06	1.39	0.01	14.67
El Geneina	12.50	0.00	33.38	11.43	0.00	34.79	8.70	0.00	30.78
Habila	0.00	0.00	0.00	0.00	0.00	44.56	0.00	0.00	0.00
Kulbus	7.14	0.00	50.00	31.25	0.00	87.54	8.33	0.00	55.69

Table 30: Child consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B6-rich foods %			Vitamin B12-rich foods %			Vitamin B complex-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Beida	58.33	16.60	100.00	59.09	14.24	100.00	50.00	12.43	100.00
Foro Baranga	0.00	0.00	0.00	15.38	0.00	50.00	0.00	0.00	0.00
Kereneik	3.70	0.00	19.54	3.70	0.00	17.69	4.00	0.00	18.20
Sirba	43.75	11.11	87.57	40.00	11.11	80.00	44.44	12.38	87.50
Jebel Moon	14.29	0.00	50.00	25.00	0.00	70.07	14.29	0.00	55.63
West Darfur State	16.24	0.01	42.81	22.31	0.01	53.56	14.06	0.01	39.02
Zalingi	21.28	2.12	45.80	43.75	21.26	68.76	16.67	2.49	37.17
Wadi Salih	23.53	0.00	60.00	45.45	0.00	100.00	16.67	0.00	50.29
Mukjar	100.00	58.24	100.00	100.00	57.92	100.00	66.67	22.22	100.00
Central Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bendasi	0.00	0.00	40.00	NA	NA	NA	0.00	0.00	0.00
Nertiti	45.45	23.80	65.53	60.98	31.79	81.49	33.33	16.32	54.86
Azum	38.46	16.62	63.64	38.46	14.79	64.74	40.00	12.50	61.14
Um Dukhun	66.67	25.00	95.86	48.39	14.29	82.68	22.58	3.44	58.84
Central Darfur State	32.04	12.41	51.66	40.53	10.02	71.04	33.39	9.47	57.31

Spatial distribution of child consumption of vitamin B

Low rates of vitamin B1-, B2-, B3-, B6-, B12- and B-complex-rich food consumption were evenly spread throughout Sudan, with pockets of high consumption rates throughout the country *(see Figure 114, Figure 116, Figure 118, Figure 120, Figure 122 and Figure 124).*

FIGURE 114:
IYCF: Diet: Consumes vitamin B1-rich foods (raster)

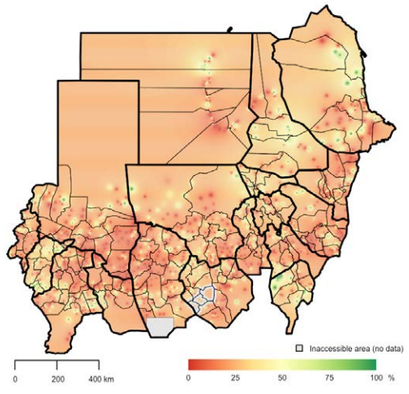


FIGURE 115:
IYCF: Diet: Consumes vitamin B1-rich foods

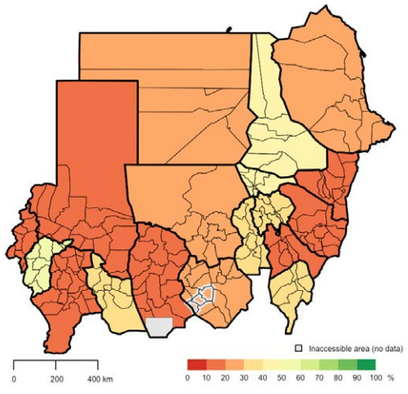


FIGURE 116:
IYCF: Diet: Consumes vitamin B2-rich foods (raster)

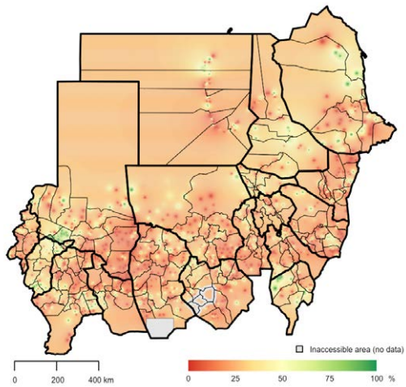


FIGURE 117:
IYCF: Diet: Consumes vitamin B2-rich foods

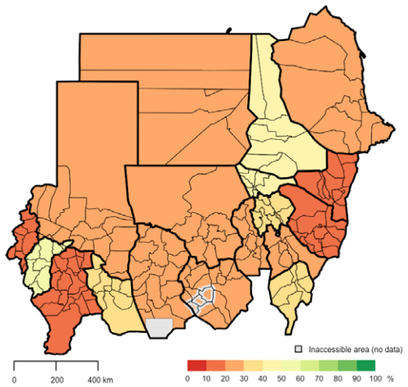


FIGURE 118:
IYCF: Diet: Consumes vitamin B3-rich foods (raster)

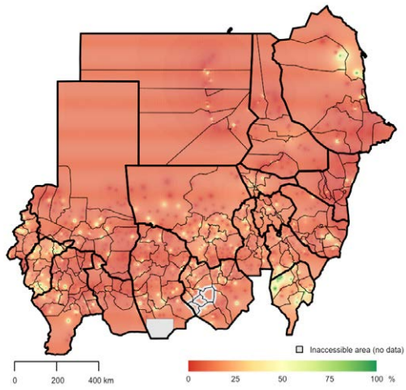


FIGURE 119:
IYCF: Diet: Consumes vitamin B3-rich foods

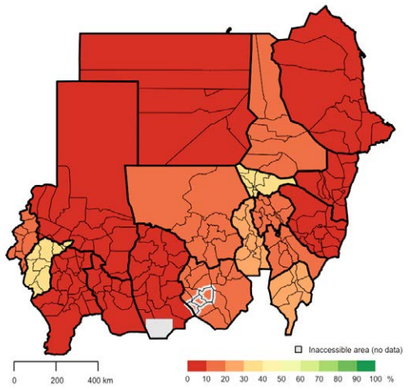


FIGURE 120:
IYCF: Diet: Consumes vitamin B6-rich foods (raster)

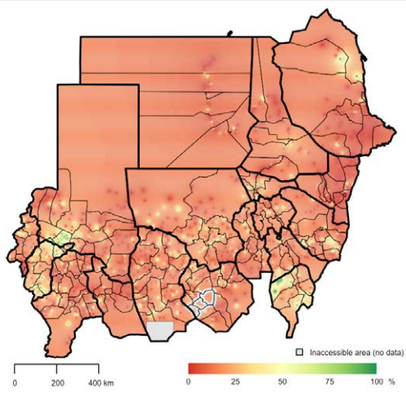


FIGURE 121:
IYCF: Diet: Consumes vitamin B6-rich foods

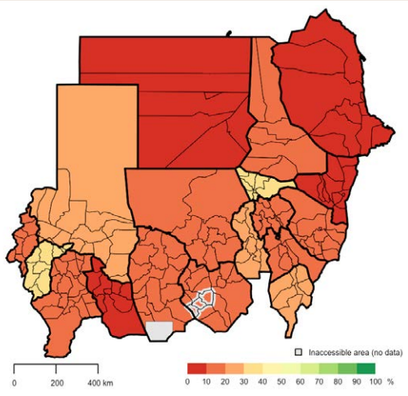


FIGURE 122:
IYCF: Diet: Consumes vitamin B12-rich foods (raster)

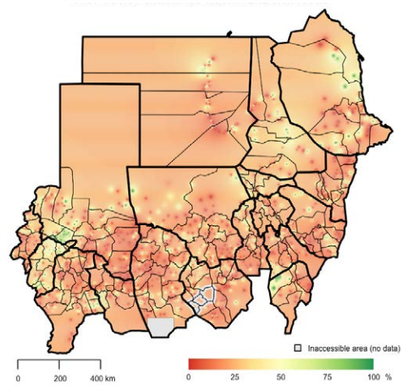


FIGURE 123:
IYCF: Diet: Consumes vitamin B12-rich foods

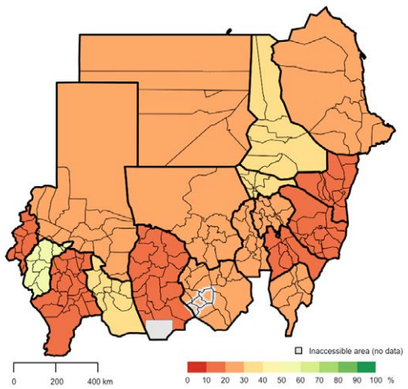


FIGURE 124:
IYCF: Diet: Consumes vitamin B1- / B2- / B3- / B6- / B12-rich foods (raster)

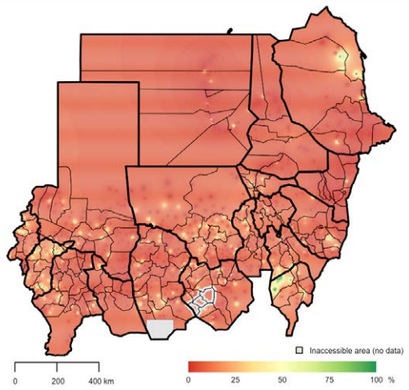
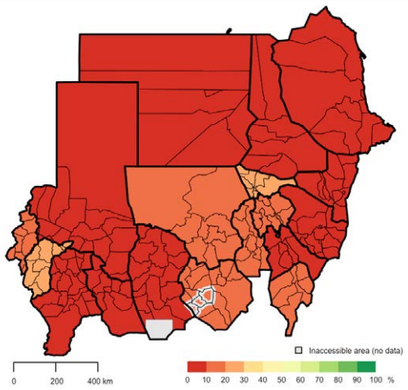


FIGURE 125:
IYCF: Diet: Consumes vitamin B1- / B2- / B3- / B6- / B12-rich foods



3.3.6 Complementary feeding

Complementary feeding average results

The mean ICFI score of children 6-8 months was 4.6 (95 per cent CI: 3.9-5.3) for all of Sudan. The proportion of children aged 6-8 months who were fed solid or semi-solid foods was 78.6 per cent (95 per cent CI: 59.3-97.9 per cent), and the proportion of children aged 6-8 months with good IYCF was 43.2 per cent (95 per cent CI: 21.3-65.1 per cent). At the state level, these complementary feeding indicators were relatively high, with very small inter-state variability *(see Figure 126)*.

At the locality level, there was high intra-state and inter-locality variability in complementary feeding indicators. About 94.5 per cent of localities had more than 50 per cent of children 6-8 months who consumed any solid or semi-solid foods. About 32.4 per cent of localities had more than 50 per cent of children 6-8 months with an ICFI score of 6. Across localities, there were moderate complementary feeding indicators *(see Figure 127)*.

Table 31 and Table 32 present results by locality, by state and at the national level for estimates of complementary feeding indicators

FIGURE 126: Box plot of state results for complementary feeding indicators

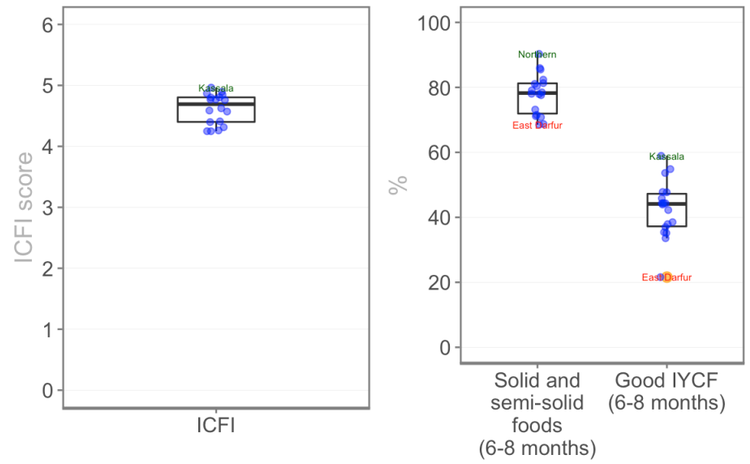


FIGURE 127: Box plot of locality results for complementary feeding indicators

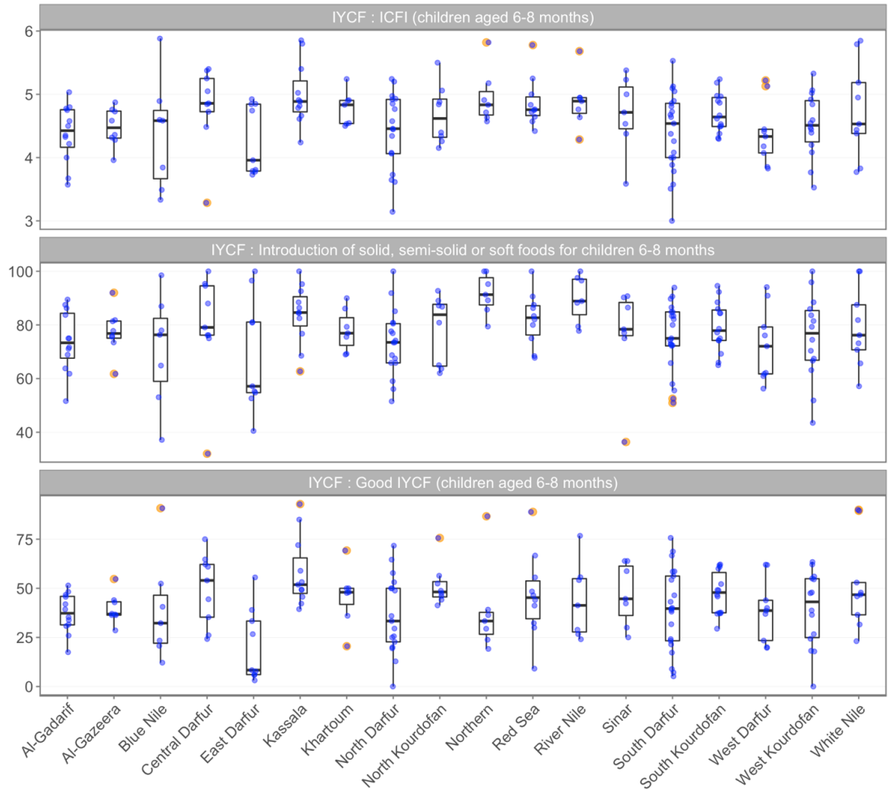


Table 31: Introduction of solid, semi-solid or soft foods for children 6-8 months by state and national

State	Introduction of solid, semi-solid or soft foods for children 6-8 months %			ICFI (Children aged 6-8 months)			Good IYCF (children aged 6-8 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	73.16	54.14	92.19	4.41	3.70	5.12	37.91	16.32	59.50
Al-Gazeera	78.47	60.78	96.16	4.59	3.87	5.30	43.93	23.53	64.33
Blue Nile	68.71	51.14	86.27	4.26	3.61	4.91	35.18	17.79	52.57
Central Darfur	80.38	62.79	97.98	4.80	4.07	5.54	47.79	21.57	74.02
East Darfur	68.50	47.98	89.03	4.25	3.60	4.89	21.60	1.26	41.94
Kassala	82.38	67.50	97.25	4.96	4.37	5.56	58.94	40.75	77.13
Khartoum	77.93	57.71	98.15	4.77	4.05	5.49	44.39	19.95	68.84
North Darfur	71.16	52.39	89.93	4.31	3.66	4.96	35.41	15.92	54.91
North Kordofan	79.09	64.55	93.63	4.77	4.16	5.38	54.84	35.90	73.77
Northern	90.29	73.90	99.99	4.85	4.15	5.54	33.56	7.26	59.86
Red Sea	85.49	64.43	99.99	4.90	4.17	5.62	44.33	17.31	71.34
River Nile	85.93	70.52	99.99	4.80	4.18	5.42	45.85	24.14	67.56
Sennar	77.59	60.00	95.17	4.62	3.97	5.28	44.30	21.77	66.82
South Darfur	70.80	44.08	97.51	4.25	3.38	5.12	36.99	13.29	60.69
South Kordofan	81.06	64.01	98.11	4.76	4.10	5.42	47.71	25.76	69.66
West Darfur	71.52	52.15	90.90	4.40	3.70	5.10	38.52	18.35	58.70
West Kordofan	78.03	59.50	96.55	4.57	3.87	5.27	42.24	20.58	63.89
White Nile	81.30	66.02	96.59	4.87	4.26	5.48	53.65	32.88	74.42
Sudan	77.37	58.36	96.39	4.62	3.92	5.31	43.26	21.25	65.26

Table 32: Introduction of solid, semi-solid or soft foods for children 6-8 months by locality and by state

Location	Introduction of solid, semi-solid or soft foods for children 6-8 months %			ICFI (Children aged 6-8 months)			Good IYCF (children aged 6-8 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	95.24	73.67	100.00	4.88	3.95	5.48	37.50	11.11	66.67
El Golid	80.00	62.50	93.75	4.55	4.03	5.03	18.92	3.12	40.02
Merwoe	88.24	71.34	100.00	4.83	4.24	5.47	30.95	11.09	65.76
El Daba	100.00	87.23	100.00	5.19	4.76	5.60	34.78	13.77	61.91
Halfa	93.48	76.91	100.00	5.15	4.42	5.67	53.85	22.22	75.00
Delgo	85.19	60.53	100.00	4.52	3.56	5.33	29.41	5.24	55.59
El Burgaig	80.77	50.00	100.00	4.50	3.39	5.40	33.33	7.12	65.01
Northern State	90.29	73.90	99.99	4.85	4.15	5.54	33.56	7.26	59.86

Table 32: Introduction of solid, semi-solid or soft foods for children 6-8 months by locality and by state

Location	Introduction of solid, semi-solid or soft foods for children 6-8 months %			ICFI (Children aged 6-8 months)			Good IYCF (children aged 6-8 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Matama	96.15	80.94	100.00	4.84	4.24	5.36	27.27	5.11	53.93
Shendi	87.27	62.96	100.00	4.83	3.88	5.55	53.85	27.27	77.78
Abu Hamad	79.55	57.08	95.75	4.12	3.47	4.72	18.75	3.01	38.46
Barbar	81.13	58.31	96.51	4.33	3.61	4.85	26.00	9.50	41.73
El Damar	80.23	67.95	92.01	5.05	4.68	5.46	59.76	46.77	76.13
Atbara	95.92	84.61	100.00	5.37	4.93	5.73	61.29	33.99	83.33
El Buhaira	94.83	84.00	100.00	5.55	5.18	5.83	70.83	51.91	89.21
River Nile State	85.93	70.52	99.99	4.80	4.18	5.42	45.85	24.14	67.56
Khartoum	87.50	70.34	100.00	5.33	4.56	5.96	74.19	48.00	96.31
Bahri	71.43	49.93	89.70	4.50	3.65	5.22	51.43	28.12	72.04
Um Durman	91.18	75.53	100.00	4.80	4.04	5.39	46.34	17.60	71.89
Um Bada	69.44	52.59	89.32	4.48	3.86	5.03	20.93	3.57	41.51
Jebel Awlia	80.00	51.99	100.00	4.62	3.78	5.32	37.50	12.50	60.00
Sharg Elneel	76.92	47.03	93.76	4.93	4.04	5.57	51.35	22.63	75.00
Karrari	75.86	53.85	93.77	4.87	4.11	5.47	45.00	20.82	75.05
Khartoum State	77.93	57.71	98.15	4.77	4.05	5.49	44.39	19.95	68.84
Greater Medani	81.40	63.63	94.67	4.86	4.18	5.43	53.49	33.30	73.81
Ganub Elgazira	88.64	72.70	100.00	4.77	4.05	5.32	46.67	28.54	65.96
El Hassahisa	80.00	61.98	93.76	4.66	3.94	5.24	46.67	25.71	68.10
El Kamlin	79.41	51.71	96.17	4.33	3.71	4.88	27.78	8.68	52.01
Sharg El Gezira	80.95	62.75	92.89	4.74	4.26	5.16	43.06	25.86	61.14
Um Elqura	72.97	52.61	90.00	4.62	3.78	5.26	45.45	24.38	65.95
El Manaqil	70.97	51.22	88.71	4.44	3.52	5.22	46.51	27.90	68.91
El Qurashi	72.00	49.92	90.48	4.33	3.46	5.11	38.10	15.14	62.33
Al-Gazeera State	78.47	60.78	96.16	4.59	3.87	5.30	43.93	23.53	64.33
Sennar	76.92	57.68	90.48	4.36	3.62	5.04	30.16	12.23	51.69
Sharg Sennar	77.42	59.15	91.67	4.56	3.89	5.18	45.45	23.05	61.12
Sinja	90.77	79.16	98.36	5.22	4.68	5.60	58.57	39.95	77.64
Abu Hujar	44.00	24.32	64.17	3.70	3.05	4.37	32.43	16.28	48.03
El Dali	90.38	70.36	100.00	5.33	4.70	5.78	60.00	38.28	84.22
Es Suki	88.14	71.16	100.00	5.00	4.40	5.50	60.78	43.47	78.95
Ed Dinder	76.19	50.00	100.00	4.68	3.92	5.36	42.11	0.00	72.73
Sennar State	77.59	60.00	95.17	4.62	3.97	5.28	44.30	21.77	66.82
Ed Damazine	75.95	61.37	89.41	4.55	3.89	5.14	44.12	25.79	61.20
El Tadamon	98.61	91.49	100.00	5.88	5.69	5.97	89.74	77.01	98.61
El Roseiris	64.29	47.36	81.94	3.91	3.25	4.61	23.53	9.07	42.90

Table 32: Introduction of solid, semi-solid or soft foods for children 6-8 months by locality and by state

Location	Introduction of solid, semi-solid or soft foods for children 6-8 months %			ICFI (Children aged 6-8 months)			Good IYCF (children aged 6-8 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Baw	40.00	18.75	64.04	3.42	2.68	4.06	22.22	8.86	36.37
Geisan	53.23	33.30	70.04	3.58	2.88	4.16	14.29	3.32	28.59
El Kurmuk	76.60	54.05	100.00	4.58	3.90	5.43	32.43	12.19	59.40
Wad El Mahi	77.63	62.69	88.62	4.57	4.04	5.09	39.51	22.49	56.93
Blue Nile State	68.71	51.14	86.27	4.26	3.61	4.91	35.18	17.79	52.57
Kosti	87.50	76.60	95.35	5.01	4.56	5.42	49.25	30.32	68.53
Guli	68.85	52.08	83.67	4.45	3.80	5.06	47.27	29.81	66.67
Tendalti	59.38	41.62	75.52	3.95	3.26	4.60	29.63	13.28	50.00
Es Salam	75.00	47.61	100.00	4.31	3.48	5.10	34.62	11.73	57.89
Rabak	86.67	70.96	96.43	5.24	4.76	5.57	56.52	37.88	72.08
El Jabalain	68.09	53.21	83.05	4.11	3.48	4.72	36.21	20.83	52.49
El Diwaim	70.83	48.14	90.71	4.47	3.42	5.31	43.90	17.39	67.90
Um Rimta	100.00	87.96	100.00	5.76	5.16	6.00	88.89	70.39	100.00
El Gitaina	100.00	100.00	100.00	5.88	5.25	6.00	91.67	61.51	100.00
White Nile State	81.30	66.02	96.59	4.87	4.26	5.48	53.65	32.88	74.42
Port Sudan	86.67	66.67	100.00	5.24	4.48	5.83	65.22	36.82	88.92
Swakin	93.33	77.49	100.00	4.75	4.13	5.20	34.48	17.07	54.85
El Gonob Welawlaib	64.00	47.80	79.47	4.43	3.81	5.03	41.18	20.00	64.30
Sinkat	81.82	57.71	97.74	4.75	4.05	5.35	45.24	22.57	64.31
Haya	91.67	50.00	100.00	4.67	3.88	5.40	7.14	0.00	50.28
Dordieb	67.50	48.62	84.13	4.34	3.53	5.03	46.94	26.25	65.83
Tokar	85.45	71.43	96.16	5.18	4.64	5.66	68.63	51.04	83.35
Agig	79.49	58.59	96.31	4.68	4.05	5.26	30.77	11.75	57.52
Gabaot Elma-aadin	70.00	41.64	100.00	4.70	4.00	5.42	43.75	18.14	73.33
Halaeeb (accessible parts)	100.00	100.00	100.00	5.43	3.55	6.00	80.00	20.00	100.00
Red Sea State	85.49	64.43	99.99	4.90	4.17	5.62	44.33	17.31	71.34
Kassala Town	68.75	51.11	83.67	4.64	4.02	5.26	59.09	41.52	77.65
Refi Kassla	63.64	46.01	78.86	4.23	3.55	4.89	42.22	26.19	59.34
Rural Western Kassala	88.89	70.82	100.00	5.48	4.68	5.91	72.97	43.47	92.59
New Halfa	81.25	62.69	98.30	4.64	3.93	5.37	52.63	33.30	71.97
Refi Nahr Atbara	95.00	76.44	100.00	5.76	5.05	6.00	92.00	72.36	100.00
Rural Khashm Elgirba	92.45	79.66	100.00	5.05	4.62	5.51	55.26	36.82	73.72
Rural Wad Elhilaiw	79.69	64.32	93.45	4.81	4.24	5.28	49.44	31.91	67.36
Rural Aroma	88.46	75.47	96.84	5.05	4.58	5.50	53.85	35.18	75.47

Table 32: Introduction of solid, semi-solid or soft foods for children 6-8 months by locality and by state

Location	Introduction of solid, semi-solid or soft foods for children 6-8 months %			ICFI (Children aged 6-8 months)			Good IYCF (children aged 6-8 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi North Delta	68.63	48.32	87.20	4.40	3.60	5.19	35.29	16.25	60.04
Refi Hamashkureib	100.00	100.00	100.00	5.85	5.70	5.96	85.94	69.04	95.71
Rural Telkok	83.87	63.56	97.07	4.81	4.15	5.36	41.18	19.91	61.82
Kassala State	82.38	67.50	97.25	4.96	4.37	5.56	58.94	40.75	77.13
Gedaref Town	71.74	48.69	89.67	4.23	3.48	4.91	30.77	9.06	52.04
Middle Geddaref	70.00	54.26	86.49	4.57	3.76	5.18	45.95	26.64	66.67
Elbutana	54.55	37.44	70.02	4.15	3.50	4.72	38.10	19.44	57.33
El Fashaga	88.24	71.05	100.00	5.05	4.48	5.62	45.16	20.83	70.45
El Rahad	74.14	51.69	90.04	4.24	3.48	4.89	32.76	17.37	50.04
Gala-a El Nahal	82.69	58.74	100.00	4.70	3.77	5.31	34.00	14.62	56.67
El Fao	82.76	65.70	97.07	4.94	4.37	5.44	56.82	36.52	74.42
El Qureisha	48.61	30.95	69.48	3.55	2.82	4.21	26.42	12.30	43.14
El Mafaza	80.00	56.24	100.00	4.63	3.74	5.57	37.50	10.53	73.33
Basunda	65.00	49.96	77.78	3.77	3.14	4.42	20.97	8.46	37.05
Western Galabat	75.00	59.60	87.50	4.76	4.02	5.28	47.22	29.83	67.66
Eastern Galabat	66.67	45.91	84.80	4.30	3.37	5.04	42.31	20.49	66.67
Al-Gadarif State	73.16	54.14	92.19	4.41	3.70	5.12	37.91	16.32	59.50
Sheikan	92.71	84.92	98.02	5.31	5.00	5.62	68.24	54.01	82.25
Um Rawaba	60.56	43.73	75.76	4.12	3.47	4.77	44.94	24.67	61.55
Um Dam Haj Ahmed	78.95	59.26	95.00	4.48	3.75	5.16	46.67	25.64	64.83
El Rahad	53.33	27.75	78.31	3.78	2.86	4.71	27.59	8.30	47.94
Bara	90.91	77.76	100.00	5.10	4.31	5.71	67.39	42.86	88.92
Gharb Bara	86.67	72.50	100.00	5.04	4.46	5.55	56.00	33.31	78.09
Soudari	85.29	67.67	96.00	4.96	4.40	5.39	50.70	35.92	64.87
Gebrat El Sheikh	68.42	50.00	84.49	4.47	3.81	5.16	53.66	32.13	72.04
North Kordofan State	79.09	64.55	93.63	4.77	4.16	5.38	54.84	35.90	73.77
Kadugli	82.81	66.67	96.02	5.00	4.31	5.56	63.93	44.90	80.65
Reif Shargi	63.64	46.93	78.28	4.56	3.87	5.13	51.35	31.90	68.75
Dilling	93.75	71.28	100.00	4.96	4.10	5.69	50.00	25.00	81.82
El Quoz	59.68	41.33	79.19	4.10	3.44	4.78	31.71	15.96	50.05
Habila	72.73	56.89	87.84	4.57	3.96	5.17	51.56	33.87	68.07
Abassiya	91.11	72.36	100.00	5.26	4.46	5.68	62.26	41.58	78.00
El Rashad	67.35	44.24	84.95	4.51	3.69	5.32	50.00	25.53	77.20
Abu Jubaiha	84.91	64.44	96.43	4.68	3.93	5.17	38.46	21.81	53.99
El Tadamon	87.50	70.82	100.00	5.27	4.46	5.80	71.05	51.02	87.31
Talodi	80.00	50.00	100.00	4.38	3.45	5.13	31.25	6.23	60.06

Table 32: Introduction of solid, semi-solid or soft foods for children 6-8 months by locality and by state

Location	Introduction of solid, semi-solid or soft foods for children 6-8 months %			ICFI (Children aged 6-8 months)			Good IYCF (children aged 6-8 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ghadeer	76.60	57.54	92.86	4.52	3.82	5.39	37.50	16.67	59.49
El Leri	74.65	63.00	87.24	4.35	3.85	4.85	35.71	20.20	54.92
Abu Karshola	87.76	71.43	100.00	4.96	4.36	5.47	37.78	8.68	65.85
Delami	83.33	62.04	100.00	4.71	3.83	5.36	47.06	25.00	68.75
South Kordofan State	81.06	64.01	98.11	4.76	4.10	5.42	47.71	25.76	69.66
Abu Zabad	84.00	65.37	97.67	5.00	4.30	5.63	63.64	44.41	84.24
ElKhiwai	65.91	43.22	87.12	4.97	4.03	5.48	52.78	30.76	72.56
Ghubaish	81.82	62.93	97.06	4.58	3.98	5.30	31.58	11.73	58.99
El Nuhud	86.27	74.11	94.68	4.89	4.37	5.36	56.52	38.06	73.22
El Idia	53.85	29.37	75.00	3.62	2.70	4.48	18.52	3.10	42.12
Wad Benda	95.71	84.19	100.00	5.32	4.67	5.74	62.50	34.68	80.35
Lagawa	90.00	60.68	100.00	4.62	3.60	5.62	50.00	25.00	83.33
Elsunut	75.00	53.55	92.32	4.26	3.60	4.88	33.33	17.00	54.30
Keilik	41.94	7.68	71.43	3.71	2.88	4.66	19.35	3.70	45.86
Es Salam	75.00	57.46	90.81	4.52	3.75	5.09	38.10	20.63	56.15
Babanusa	68.97	44.08	87.81	4.45	3.65	5.18	51.16	23.53	73.87
Abyei	63.89	41.62	85.06	4.16	3.52	4.91	25.00	6.00	52.78
El Dibab	74.19	50.00	91.31	4.54	3.75	5.17	37.50	12.88	59.27
El Meiram	100.00	66.52	100.00	4.11	3.43	5.09	0.00	0.00	40.08
West Kordofan State	78.03	59.50	96.55	4.57	3.87	5.27	42.24	20.58	63.89
El Fasher	73.49	54.69	89.01	4.59	4.05	5.09	40.54	23.93	60.61
Tawila	76.32	52.48	93.05	4.97	4.08	5.69	71.43	49.95	86.37
Melit	69.23	43.59	89.29	4.74	3.83	5.44	54.55	25.00	77.78
Um Kadada	77.22	64.57	88.25	4.36	3.97	4.74	19.59	10.13	29.79
Kebkabiya	67.39	48.64	84.22	4.82	4.20	5.37	63.33	44.65	80.44
Kutum	78.95	60.00	93.19	4.52	3.81	4.97	34.29	18.38	52.65
El Mahalha	75.00	52.93	92.03	4.62	4.00	5.19	24.32	4.76	48.58
Saraf Omra	65.79	46.12	84.01	4.04	3.40	4.60	21.95	7.14	40.95
El Serief	54.76	32.14	75.00	3.17	2.42	3.93	0.00	0.00	7.71
Dar Elsalam	94.74	82.74	100.00	5.31	4.66	5.69	51.79	31.40	72.24
Kelemando	86.54	67.24	97.87	4.95	4.10	5.58	54.90	34.53	78.05
El Tawisha	68.25	52.60	83.35	3.70	2.81	4.35	19.51	4.54	35.32
Um Baru	100.00	72.18	100.00	5.21	4.36	5.75	45.45	0.00	77.84
El Lait	78.57	44.44	100.00	4.05	3.00	4.91	31.03	8.33	57.72
ELkuma	75.00	33.33	100.00	4.17	2.84	5.34	31.25	0.00	76.92

Table 32: Introduction of solid, semi-solid or soft foods for children 6-8 months by locality and by state

Location	Introduction of solid, semi-solid or soft foods for children 6-8 months %			ICFI (Children aged 6-8 months)			Good IYCF (children aged 6-8 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Tina	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kernoi	50.00	34.78	68.10	4.14	3.66	4.58	25.37	10.64	44.28
North Darfur State	71.16	52.39	89.93	4.31	3.66	4.96	35.41	15.92	54.91
Nyala South	67.14	43.47	85.13	4.04	3.31	4.78	34.43	18.17	54.56
Nyala North	80.00	0.00	100.00	4.00	2.40	5.20	25.00	0.00	66.67
Es Salam	70.59	49.95	87.52	3.68	3.07	4.39	20.69	5.62	37.50
El Wihda	90.91	70.00	100.00	4.05	3.55	4.60	10.34	0.00	33.33
Mershing	81.03	63.00	96.52	4.42	3.91	4.89	24.29	11.09	40.02
Beliel	83.78	71.19	95.66	4.83	4.38	5.28	38.24	20.54	54.36
Nitega	82.35	50.00	100.00	5.00	3.81	5.90	58.33	29.37	94.44
Sharg El Jabal (accessible parts)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kas	73.17	57.39	89.23	4.83	4.06	5.49	57.69	38.22	78.60
Shattaya	84.09	67.24	96.97	5.18	4.60	5.66	68.89	50.00	87.12
Buram	86.27	72.58	97.84	5.09	4.58	5.60	56.60	36.36	74.57
Gereida	94.00	82.49	100.00	5.57	5.05	5.87	75.00	56.77	89.60
El Sunta	87.50	71.38	100.00	4.51	4.04	5.07	28.57	7.89	53.34
El Radoum	60.61	41.31	77.23	4.13	3.48	4.80	42.59	24.98	59.30
Tulus	57.14	0.00	86.40	4.00	2.27	5.23	38.46	0.00	75.00
Damso	68.75	36.67	94.12	4.37	3.33	5.55	43.33	17.65	71.51
Ed Elfursan	54.55	26.42	72.86	3.52	2.92	4.02	8.62	0.00	23.22
Kubum	74.19	54.87	92.74	3.61	2.62	4.54	17.02	2.49	37.06
Kateila	50.00	34.28	68.31	2.98	2.60	3.56	6.45	0.00	20.83
Rehaid Elbirdi	65.57	47.43	79.68	4.76	4.10	5.25	58.33	43.84	73.69
Um Dafoug	73.17	47.33	93.03	4.54	3.80	5.31	54.84	32.26	76.68
South Darfur State	70.80	44.08	97.51	4.25	3.38	5.12	36.99	13.29	60.69
Abu Jabra	48.84	27.44	70.39	3.70	3.11	4.44	9.09	0.00	28.90
Abu Karinka	55.17	31.25	80.95	3.87	3.13	4.61	17.95	0.00	47.38
Bahr El Arab	52.17	27.27	76.54	3.81	3.16	4.46	6.90	0.00	24.01
Adila	54.55	27.27	81.84	3.71	2.87	4.57	8.33	0.00	37.53
Ed Dain	83.33	62.04	97.50	4.89	4.05	5.48	48.00	25.00	72.43
Assalaya	96.30	82.92	100.00	4.82	4.33	5.23	23.91	5.69	50.00
El Firdous	97.50	85.29	100.00	5.24	4.74	5.59	50.00	24.24	72.53
Shia-ria	79.63	63.83	91.49	4.75	4.23	5.21	41.30	21.65	64.11
Yassin	55.56	34.77	75.00	3.70	3.12	4.13	8.00	0.00	21.18
East Darfur State	68.50	47.98	89.03	4.25	3.60	4.89	21.60	1.26	41.94
El Geneina	80.33	62.49	94.45	4.71	4.12	5.24	44.44	27.12	63.67

Table 32: Introduction of solid, semi-solid or soft foods for children 6-8 months by locality and by state

Location	Introduction of solid, semi-solid or soft foods for children 6-8 months %			ICFI (Children aged 6-8 months)			Good IYCF (children aged 6-8 months) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Habila	80.36	60.40	92.59	4.12	3.67	4.62	24.44	8.89	43.14
Kulbus	62.50	27.78	86.67	4.33	3.36	5.31	40.74	5.87	69.29
Beida	92.31	77.16	100.00	5.06	4.42	5.51	57.14	39.02	75.61
Foro Baranga	51.35	24.24	75.03	3.76	2.78	4.70	23.33	6.22	46.88
Kereneik	68.82	56.38	81.37	4.22	3.70	4.76	35.96	22.67	50.00
Sirba	64.71	40.32	86.88	3.98	3.20	4.72	22.97	8.47	40.32
Jebel Moon	61.90	41.12	81.57	4.23	3.53	5.00	42.55	22.20	65.83
West Darfur State	71.52	52.15	90.90	4.40	3.70	5.10	38.52	18.35	58.70
Zalingi	70.23	58.87	82.79	4.34	3.94	4.69	31.25	19.03	42.71
Wadi Salih	79.55	59.43	93.02	4.89	4.19	5.45	54.17	31.53	73.68
Mukjar	94.59	83.78	100.00	5.23	4.74	5.63	61.82	45.92	79.49
Central Jebel Mara	73.51	40.00	100.00	4.90	3.67	5.90	63.64	29.41	88.24
North Jebel Mara	100.00	63.09	100.00	5.21	4.21	5.60	25.00	0.00	71.43
Bendasi	32.14	10.33	57.14	3.25	2.64	4.18	25.00	4.76	50.00
Nertiti	85.42	67.52	100.00	5.34	4.62	5.81	71.88	52.88	91.51
Azum	88.89	63.31	100.00	5.55	4.76	6.00	77.78	47.33	100.00
Um Dukhun	95.35	83.59	100.00	4.79	4.31	5.31	39.58	15.90	65.25
Central Darfur State	80.38	62.79	97.98	4.80	4.07	5.54	47.79	21.57	74.02

Spatial distribution of complementary feeding

FIGURE 128:
IYCF: Introduction of solid, semi-solid or soft foods for children 6-8 months (raster)

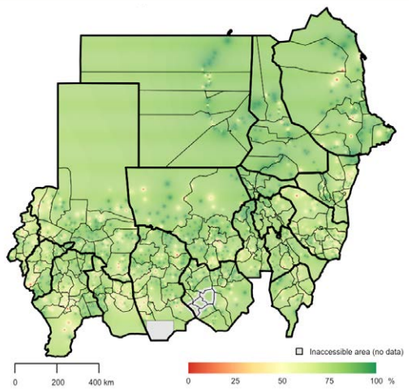


FIGURE 129:
IYCF: Introduction of solid, semi-solid or soft foods for children 6-8 months

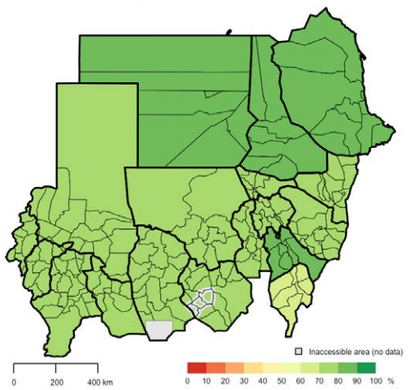


FIGURE 130:
IYCF: ICFI (children aged 6-8 months) (raster)

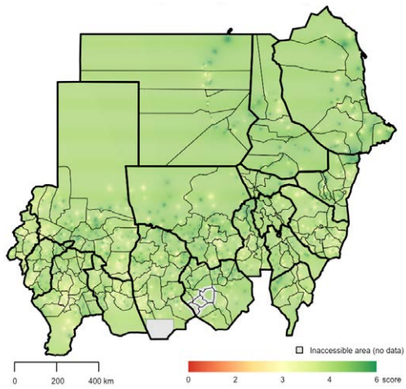


FIGURE 131:
IYCF: ICFI (children aged 6-8 months)

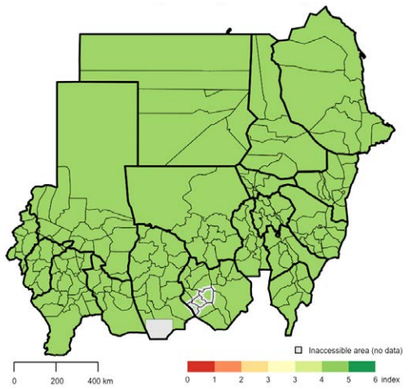


FIGURE 132:
IYCF: Good IYCF (children aged 6-8 months) (raster)

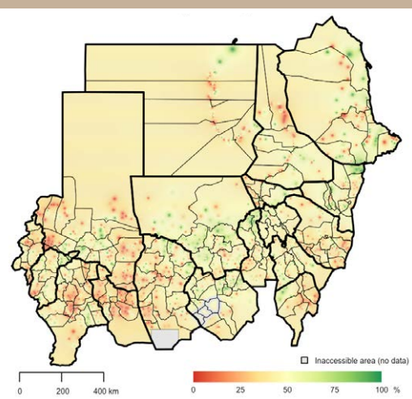
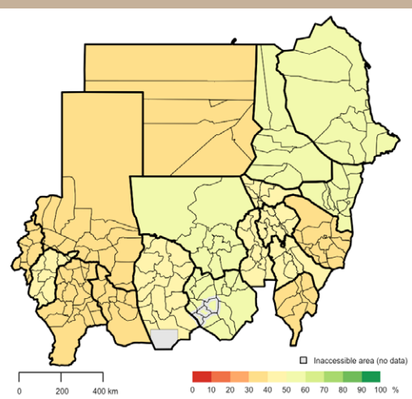


FIGURE 133: IYCF: Good IYCF (children aged 6-8 months)



3.4 Coverage of growth monitoring and screening using mid-upper-arm circumference (MUAC) and infant and young child feeding (IYCF) counselling

Coverage of growth monitoring and screening using MUAC and IYCF counselling average results

Coverage of screening for acute undernutrition cases using MUAC in the month prior to the survey was extremely low at 6.03 per cent (95 per cent CI: 1.54-10.51 per cent). This level of coverage only improved slightly when assessed over a longer time period of three months prior to the survey, with 12.89 per cent (95 per cent CI: 6.62-19.16 per cent) coverage of screening with MUAC. Growth monitoring coverage was also low at 7.55 per cent (95 per cent CI: 3.86-11.23 per cent). Coverage of IYCF counselling and messages fared better, though still below the recommended 50 per cent minimum, at 38.36 per cent (95 per cent CI: 27.68-49.03 per cent).

Red Sea state had the highest coverage of all states across all the screening coverage indicators assessed, but it still had coverage levels below 50 per cent *(see Figure 134)*. Across localities, there

was wide variability of coverage between localities, but with most still achieving lower than 50 per cent coverage. Only 1.6 per cent of localities had over 50 per cent coverage of MUAC screenings in the one month before the survey, and only 7.6 per cent of localities had over 50 per cent coverage for MUAC screenings in the three months before the survey.

For GMP coverage it was much worse, with only 0.5 per cent of localities reaching higher than 50 per cent coverage. IYCF counselling and messages had relatively better results, in that 18.9 per cent of localities achieving greater than 50 per cent coverage. Table 33 and Table 34 present results by locality, by state and at the national level for coverage of child nutrition screening activities.

FIGURE 134: Box plot of state and locality results for coverage of child nutrition screening activities

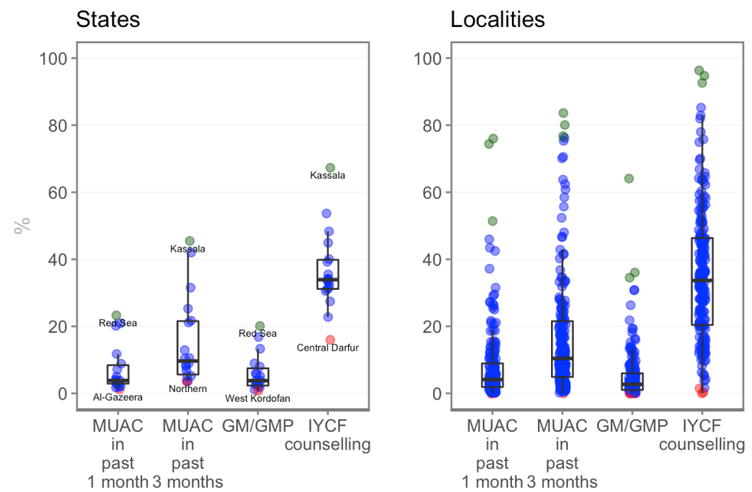


Table 33: Screening coverage using MUAC, growth monitoring coverage and IYCF counselling / messaging coverage by state and national

State	MUAC screening in past month %			MUAC screening in past three months %			GM / GMP coverage %			IYCF Counselling or messaging Coverage %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	3.82	1.33	6.31	10.36	4.58	16.15	1.70	0.15	3.25	34.15	24.63	43.68
Al-Gazeera	1.19	0.01	2.49	3.64	0.97	6.31	7.99	4.26	11.73	33.70	18.39	49.00
Blue Nile	20.92	10.31	31.53	31.53	19.21	43.85	3.49	1.08	5.90	39.23	31.60	46.86
Central Darfur	3.00	0.01	6.01	6.84	2.31	11.37	1.13	0.01	2.76	15.98	8.39	23.57
East Darfur	3.17	0.65	5.69	10.56	4.03	17.10	2.20	0.29	4.11	31.48	22.75	40.22
Kassala	20.16	12.37	27.95	45.47	36.23	54.71	13.31	8.80	17.82	67.29	59.49	75.09
Khartoum	1.91	0.01	4.02	3.63	0.89	6.38	16.82	11.22	22.43	53.66	43.38	63.93

Table 33: Screening coverage using MUAC, growth monitoring coverage and IYCF counselling / messaging coverage by state and national

State	MUAC screening in past month %			MUAC screening in past three months %			GM / GMP coverage %			IYCF Counselling or messaging Coverage %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
North Darfur	11.75	5.49	18.01	21.70	14.16	29.25	3.75	1.31	6.20	34.12	23.89	44.35
North Kordofan	4.97	1.35	8.58	12.92	7.11	18.74	2.56	0.92	4.20	35.49	25.22	45.77
Northern	1.73	0.01	3.74	3.62	0.78	6.46	3.83	1.05	6.61	48.31	37.15	59.47
Red Sea	23.28	15.54	31.02	42.01	31.10	52.92	20.10	14.47	25.73	44.90	34.69	55.10
River Nile	2.16	0.01	4.44	5.18	1.28	9.09	5.81	3.16	8.45	27.44	18.01	36.88
Sennar	2.88	0.01	6.53	5.22	0.01	10.57	8.94	5.54	12.35	33.29	25.15	41.42
South Darfur	4.11	0.01	9.53	8.47	1.10	15.85	2.68	0.01	5.95	30.55	18.66	42.43
South Kordofan	8.85	2.50	15.20	21.14	11.95	30.33	2.26	0.38	4.13	32.45	20.81	44.09
West Darfur	7.13	2.67	11.59	25.29	16.86	33.71	5.98	2.27	9.69	40.04	29.85	50.24
West Kordofan	3.85	0.94	6.77	8.95	3.91	13.98	0.79	0.01	1.73	22.77	14.12	31.42
White Nile	3.08	0.54	5.62	8.08	3.38	12.79	5.16	2.06	8.26	31.05	22.46	39.64
Sudan	6.03	1.54	10.51	12.89	6.62	19.16	7.51	3.86	11.16	38.37	27.70	49.04

Table 34: Screening coverage using MUAC, GM / GMP coverage and IYCF counselling / messaging coverage by locality and by state

Location	MUAC screening in past month %			MUAC screening in past three months %			GM / GMP coverage %			IYCF Counselling or messaging Coverage %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	2.10	0.51	4.43	3.48	1.13	6.24	8.43	5.42	12.91	55.56	47.03	64.22
El Golid	1.17	0.31	2.40	4.54	2.55	6.67	4.68	1.20	8.99	69.07	54.78	81.20
Merwoe	1.59	0.00	4.39	3.46	1.04	6.67	1.03	0.00	2.79	41.08	28.37	52.29
El Daba	2.18	0.38	5.38	4.44	1.43	9.67	1.52	0.17	3.63	63.61	50.32	76.59
Halfa	1.82	0.53	3.91	3.27	1.79	6.47	7.96	5.91	10.46	24.24	14.89	33.42
Delgo	0.32	0.00	1.35	1.12	0.16	2.50	1.05	0.15	2.36	16.46	11.51	22.66
El Burgaig	1.38	0.37	2.95	2.78	1.26	4.77	3.80	1.68	6.33	28.92	19.99	38.14
Northern State	1.73	0.01	3.74	3.62	0.78	6.46	3.83	1.05	6.61	48.31	37.15	59.47
El Matama	0.47	0.00	1.80	2.61	0.75	5.31	7.51	4.13	11.45	30.48	20.03	43.75
Shendi	2.71	0.29	6.33	6.29	1.33	14.04	3.77	1.65	6.14	23.92	13.03	34.94
Abu Hamad	6.14	2.56	10.45	17.99	11.62	23.64	4.72	2.64	6.94	15.87	10.87	21.57
Barbar	0.40	0.00	1.47	1.69	0.50	3.42	5.60	2.34	9.71	15.15	9.34	23.11
El Damar	2.15	0.94	4.13	3.25	1.78	5.56	5.61	4.04	6.88	38.00	31.48	44.98
Atbara	0.96	0.13	2.23	1.44	0.26	3.04	8.12	5.65	10.93	32.58	23.16	42.94
El Buhaira	2.07	0.99	3.47	5.69	3.67	8.29	8.46	4.87	12.28	30.60	23.01	38.82
River Nile State	2.16	0.01	4.44	5.18	1.28	9.09	5.81	3.16	8.45	27.44	18.01	36.88
Khartoum	1.86	0.47	4.39	3.30	1.52	5.46	17.02	12.19	21.64	56.09	46.10	65.40
Bahri	0.60	0.00	1.41	1.42	0.15	3.42	30.10	20.05	39.41	58.80	46.80	68.57
Um Durman	1.01	0.12	2.20	1.95	0.61	3.85	19.19	14.39	24.07	35.65	26.91	46.06
Um Bada	1.61	0.26	3.71	2.30	0.91	4.35	14.11	10.87	19.26	58.60	47.57	70.06
Jebel Awlia	3.27	0.54	7.98	6.61	2.45	12.41	12.82	8.44	18.26	36.43	27.91	47.70
Sharg Elneel	1.72	0.31	3.85	4.02	1.49	5.99	14.99	11.08	19.61	64.73	54.21	76.35
Karrari	1.93	0.61	3.74	4.15	1.94	7.38	14.23	10.39	18.21	63.13	53.67	70.34
Khartoum State	1.91	0.01	4.02	3.63	0.89	6.38	16.82	11.22	22.43	53.66	43.38	63.93
Greater Medani	2.78	1.00	5.03	8.39	4.67	12.42	20.82	14.78	27.03	48.67	34.68	60.25
Ganub Elgazira	0.97	0.00	2.52	3.77	1.64	6.65	12.72	7.88	18.59	38.94	23.54	54.62
El Hassahisa	0.15	0.00	0.91	1.50	0.31	3.64	11.22	8.43	14.50	38.90	25.51	57.41
El Kamlin	1.40	0.18	3.08	2.83	0.35	5.95	6.49	3.19	10.25	24.07	4.03	47.35
Sharg El Gezira	0.79	0.14	1.83	2.95	1.21	4.83	3.81	1.98	6.98	22.14	11.55	32.92
Um Elqura	0.76	0.00	2.24	5.15	2.09	8.24	4.14	1.67	8.13	31.60	12.61	51.46
El Manaqil	1.25	0.41	2.79	3.51	1.58	6.02	2.31	1.23	3.59	28.20	17.62	37.66
El Qurashi	1.66	0.49	3.29	3.69	2.00	6.01	5.75	3.04	8.61	35.99	22.36	49.04
Al-Gazeera State	1.19	0.01	2.49	3.64	0.97	6.31	7.99	4.26	11.73	33.70	18.39	49.00
Sennar	0.28	0.00	0.92	1.32	0.44	2.56	25.17	19.58	30.74	42.83	35.45	50.35
Sharg Sennar	0.90	0.13	2.12	2.07	0.77	3.91	0.47	0.00	1.58	12.08	8.25	16.38
Sinja	2.35	0.93	4.07	4.83	2.39	8.27	14.26	9.84	18.40	41.14	32.08	49.71
Abu Hujar	4.52	1.42	8.79	9.46	3.56	15.66	1.02	0.12	2.36	31.44	20.32	44.89
El Dali	1.05	0.12	2.72	2.92	0.91	5.33	2.55	0.84	5.71	19.84	12.25	27.62
Es Suki	1.69	0.28	3.68	3.73	1.61	6.63	5.64	3.35	8.56	49.s1	40.13	57.29
Ed Dinder	10.03	3.44	18.02	13.63	5.19	29.84	1.57	0.14	3.65	26.42	18.00	33.78
Sennar State	2.88	0.01	6.53	5.22	0.01	10.57	8.94	5.54	12.35	33.29	25.15	41.42
Ed Damazine	3.36	1.60	5.53	9.94	6.13	14.75	3.92	2.24	6.12	24.64	19.52	30.57
El Tadamon	10.47	1.17	22.64	18.77	10.15	28.70	1.07	0.14	2.41	69.73	64.16	75.90
El Roseiris	18.81	8.65	26.63	30.51	18.62	43.52	6.73	3.19	10.76	42.34	32.84	52.83
Baw	4.32	1.68	8.01	21.44	13.24	28.78	0.34	0.00	2.06	44.80	35.11	55.39
Geisan	29.43	20.85	38.25	43.36	31.25	54.79	1.03	0.15	2.49	50.45	46.08	53.90
El Kurmuk	42.00	33.32	56.76	52.69	42.17	66.52	3.08	0.90	6.02	24.70	18.48	31.24
Wad El Mahi	55.38	37.27	74.14	58.62	37.34	77.71	3.53	0.83	6.86	38.09	30.37	47.90

Table 34: Screening coverage using MUAC, GM / GMP coverage and IYCF counselling / messaging coverage by locality and by state

Location	MUAC screening in past month %			MUAC screening in past three months %			GM / GMP coverage %			IYCF Counselling or messaging Coverage %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Blue Nile State	20.92	10.31	31.53	31.53	19.21	43.85	3.49	1.08	5.90	39.23	31.60	46.86
Kosti	5.24	2.59	8.41	8.85	5.24	13.93	5.57	2.43	9.74	40.12	30.66	49.31
Guli	3.19	1.29	6.88	6.92	3.65	12.14	1.38	0.25	2.91	13.62	6.70	20.80
Tendalti	3.42	1.50	6.68	9.81	4.24	17.73	1.30	0.14	2.89	38.05	29.74	44.95
Es Salam	2.34	0.83	4.72	9.33	4.26	16.25	0.14	0.00	0.99	27.52	19.01	37.37
Rabak	5.42	2.89	8.39	23.16	16.90	30.33	17.88	13.11	23.66	56.87	45.43	67.88
El Jabalain	4.97	1.82	10.42	11.36	5.33	18.65	3.89	1.95	6.13	46.02	37.65	55.39
El Diwaim	0.87	0.15	1.80	1.87	0.87	3.16	1.20	0.27	2.42	15.65	11.65	19.74
Um Rimta	0.00	0.00	0.46	0.00	0.00	0.52	1.90	0.57	3.68	9.69	5.42	14.57
El Gitaina	0.15	0.00	0.79	0.31	0.00	0.94	5.79	2.07	10.69	15.67	7.31	25.70
White Nile State	3.08	0.54	5.62	8.08	3.38	12.79	5.16	2.06	8.26	31.05	22.46	39.64
Port Sudan	17.33	11.43	26.07	27.42	21.32	35.34	40.49	33.37	46.75	64.16	54.63	72.97
Swakin	16.69	11.51	22.03	27.79	18.39	35.96	7.18	3.98	10.64	43.83	36.94	51.11
El Gonob Welawlaib	15.18	8.40	21.96	26.79	15.81	36.23	7.52	2.77	12.97	25.50	16.00	36.44
Sinkat	27.19	18.54	37.16	42.23	30.79	55.56	5.26	2.45	9.31	51.99	41.16	62.90
Haya	4.04	1.33	8.37	19.94	10.33	32.32	1.16	0.00	3.30	5.79	1.86	9.82
Dordieb	26.62	14.23	39.14	40.72	24.82	57.69	11.98	6.16	18.17	16.18	5.37	25.58
Tokar	71.68	60.33	79.64	82.21	71.70	88.78	64.86	54.89	70.98	85.10	72.72	93.32
Agig	44.78	35.75	53.39	70.70	61.56	77.29	32.85	23.08	42.77	92.57	80.99	98.22
Gabaot Elma-aadin	25.89	18.27	33.34	75.71	64.47	83.30	11.85	5.18	17.97	63.20	55.27	70.99
Halaeeb (accessible parts)	17.80	3.57	29.52	75.58	54.70	89.13	5.37	0.00	11.52	37.01	10.78	55.08
Red Sea State	23.28	15.54	31.02	42.01	31.10	52.92	20.10	14.47	25.73	44.90	34.69	55.10
Kassala Town	5.42	2.73	8.18	24.08	17.24	32.12	30.60	25.85	35.28	70.57	61.40	77.48
Refi Kassla	23.80	16.06	30.65	59.98	49.99	70.09	11.97	7.62	16.09	73.65	66.69	80.99
Rural Western Kassala	2.70	0.74	5.61	11.59	6.12	17.29	2.85	1.64	4.62	34.67	26.56	42.67
New Halfa	6.06	3.26	10.70	13.14	7.70	19.58	4.54	2.91	6.92	50.00	38.09	61.25
Refi Nahr Atbara	14.19	7.12	21.49	21.19	12.23	30.73	4.94	2.30	8.73	15.05	8.88	22.32
Rural Khashm Elgirba	9.79	5.77	14.87	46.11	39.62	53.87	3.22	1.56	5.69	94.58	91.13	97.20
Rural Wad Elhilaiw	28.94	21.50	36.22	51.32	38.94	62.89	6.00	3.25	9.08	69.60	56.36	80.82
Rural Aroma	46.79	35.73	57.99	54.51	44.71	64.83	11.53	6.75	17.06	86.45	79.47	92.65
Refi North Delta	37.76	22.90	51.47	64.06	51.11	75.49	10.31	6.13	15.21	76.49	70.28	83.15

Table 34: Screening coverage using MUAC, GM / GMP coverage and IYCF counselling / messaging coverage by locality and by state

Location	MUAC screening in past month %			MUAC screening in past three months %			GM / GMP coverage %			IYCF Counselling or messaging Coverage %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi Hamashkureib	31.19	24.84	37.35	77.47	67.28	88.17	19.22	14.54	25.06	96.59	93.28	99.17
Rural Telkok	29.53	18.75	42.38	70.11	59.71	78.41	11.03	6.12	20.00	63.21	54.34	72.26
Kassala State	20.16	12.37	27.95	45.47	36.23	54.71	13.31	8.80	17.82	67.29	59.49	75.09
Gedaref Town	7.31	4.96	9.77	18.33	10.83	26.55	4.39	2.20	6.67	28.02	17.78	40.51
Middle Geddaref	1.66	0.45	3.32	8.97	3.21	15.96	1.93	0.43	4.39	39.88	31.88	47.10
Elbutana	0.93	0.26	2.18	2.39	0.92	4.05	0.00	0.00	0.00	29.61	24.42	35.85
El Fashaga	5.42	2.83	8.98	16.09	7.93	26.57	5.09	2.04	8.45	43.94	37.57	51.65
El Rahad	1.62	0.15	4.37	3.24	0.75	6.56	0.13	0.00	0.66	22.05	14.11	33.01
Gala-a El Nahal	4.85	1.82	9.82	9.83	5.75	17.24	1.06	0.15	3.49	31.31	24.24	39.60
El Fao	1.72	0.38	3.55	5.20	2.74	8.60	1.81	0.57	3.61	40.34	34.02	46.92
El Qureisha	4.83	2.60	7.44	8.19	5.30	11.60	0.26	0.00	1.14	63.24	52.18	72.76
El Mafaza	4.35	1.76	7.84	16.69	9.07	24.24	0.00	0.00	0.00	37.45	27.48	47.73
Basunda	3.35	1.66	5.18	10.48	5.59	15.53	0.82	0.13	2.16	36.29	24.37	47.07
Western Galabat	4.55	1.68	8.36	8.78	4.87	13.93	0.54	0.00	1.36	14.32	8.34	20.00
Eastern Galabat	3.30	1.15	6.11	7.32	3.94	11.33	1.15	0.12	2.74	33.72	23.33	43.95
Al-Gadarif State	3.82	1.33	6.31	10.36	4.58	16.15	1.70	0.15	3.25	34.15	24.63	43.68
Sheikan	3.79	2.28	5.51	10.51	7.66	14.21	5.32	3.50	7.26	48.70	39.28	57.24
Um Rawaba	4.73	3.03	6.23	15.56	9.30	23.47	0.69	0.21	1.47	32.06	22.45	42.93
Um Dam Haj Ahmed	8.09	3.71	14.18	18.10	11.24	25.60	2.55	0.79	4.90	36.46	23.88	48.68
El Rahad	3.91	1.67	7.34	14.15	9.75	20.27	3.01	1.18	4.99	37.39	26.50	50.52
Bara	7.30	3.41	11.54	14.14	10.20	19.67	2.29	1.02	3.91	33.37	26.52	42.19
Gharb Bara	2.85	1.10	4.83	6.19	3.09	9.71	0.79	0.12	1.92	19.21	13.68	26.55
Soudari	2.62	1.05	4.98	6.95	2.94	12.14	1.27	0.40	2.48	20.72	13.01	28.04
Gebrat El Sheikh	11.02	4.69	20.45	20.88	11.75	32.28	1.73	0.37	4.10	41.33	27.81	53.96
North Kordofan State	4.97	1.35	8.58	12.92	7.11	18.74	2.56	0.92	4.20	35.49	25.22	45.77
Kadugli	13.57	9.95	17.26	34.85	28.55	40.89	7.82	4.67	11.33	46.26	38.66	54.33
Reif Shargi	26.09	19.97	31.81	55.59	43.41	65.12	2.17	0.78	4.30	36.56	26.54	44.31
Dilling	14.85	2.77	29.16	25.71	10.61	44.29	2.69	0.84	5.29	28.25	14.93	41.19
El Quoz	6.50	4.30	9.93	20.23	13.78	27.92	2.04	0.91	3.25	36.40	28.60	42.48
Habila	6.47	2.20	11.75	15.18	7.64	23.94	2.07	0.87	3.69	34.32	25.30	44.43
Abassiya	5.80	1.70	11.37	14.56	8.27	22.54	1.73	0.71	3.06	16.41	8.86	28.09
El Rashad	8.04	4.19	12.83	17.15	10.85	26.19	1.83	0.58	3.81	24.78	15.23	38.12
Abu Jubaiha	6.72	3.47	11.31	14.90	8.76	22.82	0.68	0.00	2.41	32.14	21.73	43.45

Table 34: Screening coverage using MUAC, GM / GMP coverage and IYCF counselling / messaging coverage by locality and by state

Location	MUAC screening in past month %			MUAC screening in past three months %			GM / GMP coverage %			IYCF Counselling or messaging Coverage %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Tadamon	8.04	4.78	12.11	21.31	14.58	28.70	1.43	0.45	2.56	32.73	20.77	46.60
Talodi	10.29	2.98	21.70	37.56	24.71	46.08	3.07	0.86	7.67	42.61	17.48	65.54
Ghadeer	3.54	0.65	9.27	8.03	3.17	16.59	1.65	0.00	3.92	13.64	7.61	20.64
El Leri	5.21	1.83	11.76	11.85	5.30	21.78	2.81	1.12	4.98	12.50	7.79	19.79
Abu Karshola	6.85	3.63	11.54	17.33	11.32	24.34	1.09	0.13	2.48	53.27	39.88	66.77
Delami	20.64	7.58	33.24	45.95	20.09	70.34	1.74	0.46	3.35	37.35	28.83	45.50
South Kordofan State	8.85	2.50	15.20	21.14	11.95	30.33	2.26	0.38	4.13	32.45	20.81	44.09
Abu Zabad	9.44	3.79	16.01	12.35	4.90	20.90	0.37	0.00	1.24	19.60	11.36	30.50
ElKhiwai	8.55	5.61	12.06	19.85	12.73	29.37	0.82	0.13	2.02	12.43	7.94	17.94
Ghubaish	4.14	1.99	6.97	11.10	7.27	15.79	0.00	0.00	0.63	28.71	20.95	35.86
El Nuhud	1.77	0.69	3.16	5.97	3.42	9.63	0.40	0.00	1.03	27.44	18.70	38.19
El Idia	3.12	1.51	8.12	10.98	5.90	17.25	1.32	0.47	2.50	36.27	26.21	45.91
Wad Benda	3.11	1.32	5.12	5.43	3.42	8.04	0.67	0.00	1.67	11.33	6.51	17.18
Lagawa	2.92	1.07	5.69	5.68	2.68	9.53	0.70	0.00	2.23	13.06	7.43	19.46
Elsunut	2.87	0.74	5.75	4.70	1.63	9.04	1.26	0.27	2.97	18.01	11.35	24.48
Keilik	4.76	2.88	6.74	8.46	5.33	12.01	2.12	0.88	3.63	12.45	7.04	18.46
Es Salam	4.40	2.53	6.68	14.59	10.43	20.51	3.67	1.73	6.16	52.66	42.40	62.58
Babanusa	1.42	0.15	4.08	6.07	0.86	14.88	1.89	0.77	3.45	14.64	9.38	19.14
Abyei	3.49	1.37	6.84	7.59	4.29	11.60	0.00	0.00	0.00	11.82	6.61	18.09
El Dibab	2.08	0.35	4.75	2.64	0.00	5.88	0.00	0.00	0.00	18.63	7.32	30.30
El Meiram	4.55	2.24	7.31	13.90	8.33	18.86	0.00	0.00	1.60	20.52	11.92	32.80
West Kordofan State	3.85	0.94	6.77	8.95	3.91	13.98	0.79	0.01	1.73	22.77	14.12	31.42
El Fasher	13.06	9.92	16.46	25.88	21.04	31.98	3.28	2.01	5.10	42.60	36.47	49.17
Tawila	27.80	14.75	40.69	32.93	18.94	48.09	0.95	0.14	2.11	48.81	32.39	64.27
Melit	15.09	6.16	27.76	28.49	17.31	40.57	1.77	0.53	3.14	8.74	5.83	13.18
Um Kadada	12.88	8.87	17.10	22.91	15.60	30.21	6.94	3.85	10.24	53.63	44.27	64.32
Kebkabiya	1.90	0.52	3.87	21.47	16.25	26.95	2.79	1.41	4.47	49.59	43.29	55.07
Kutum	15.59	9.13	23.62	22.53	14.72	32.23	2.93	1.16	5.28	31.91	20.03	45.81
El Mahalha	14.44	5.23	21.72	17.70	9.58	26.07	2.30	0.90	3.64	10.99	6.04	16.60
Saraf Omra	3.32	1.42	6.17	9.17	5.26	13.60	0.33	0.00	1.26	19.79	9.56	30.49
El Serief	5.79	3.39	8.66	9.87	6.41	13.71	1.15	0.14	2.50	5.27	2.28	8.47
Dar Elsalam	20.11	12.64	31.11	46.79	36.00	57.25	21.05	14.84	27.89	59.26	50.05	67.51
Kelemando	53.84	42.73	63.39	63.06	53.33	72.60	9.49	5.36	13.88	55.62	46.32	65.05
El Tawisha	5.25	2.35	8.72	9.37	4.42	16.17	4.10	1.16	8.26	42.93	34.05	53.04

Table 34: Screening coverage using MUAC, GM / GMP coverage and IYCF counselling / messaging coverage by locality and by state

Location	MUAC screening in past month %			MUAC screening in past three months %			GM / GMP coverage %			IYCF Counselling or messaging Coverage %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Um Baru	5.54	2.32	12.68	9.55	5.55	15.63	3.08	0.97	5.60	33.92	21.74	43.91
El Lait	10.82	6.11	16.07	19.24	12.82	26.43	3.51	1.22	6.58	23.78	17.26	30.02
ELkuma	14.67	7.98	22.00	26.38	9.64	37.89	2.42	0.00	6.23	80.47	60.63	90.70
El Tina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	50.00
Kernoi	2.35	1.37	3.60	6.70	4.65	9.84	2.33	1.01	3.68	14.04	8.68	22.76
North Darfur State	11.75	5.49	18.01	21.70	14.16	29.25	3.75	1.31	6.20	34.12	23.89	44.35
Nyala South	6.11	3.75	9.11	11.05	7.88	14.54	2.24	0.94	4.05	34.53	28.21	41.56
Nyala North	10.37	0.00	28.25	19.72	2.22	40.44	7.05	0.93	14.29	33.96	6.91	58.87
Es Salam	3.66	2.03	5.35	7.77	4.84	11.22	3.34	1.86	5.02	48.07	41.91	54.80
El Wihda	7.86	2.64	13.10	15.98	8.25	23.31	8.91	5.79	12.67	34.20	28.99	39.56
Mershing	8.14	4.73	12.40	16.87	11.69	22.92	11.67	8.11	15.06	27.02	22.72	31.34
Beliel	3.70	2.23	5.43	12.61	9.57	15.94	3.35	2.09	4.77	63.63	59.84	67.08
Nitega	5.36	1.58	9.99	11.78	4.26	18.78	2.46	0.84	4.84	29.23	21.63	35.53
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	5.56	0.00	17.70	0.00	0.00	0.00	0.00	0.00	0.00
Kas	7.01	4.17	10.96	13.58	9.13	19.56	1.25	0.45	2.44	16.18	9.83	22.69
Shattaya	10.29	6.49	13.70	17.12	11.34	22.60	2.01	0.67	3.63	21.54	12.66	29.20
Buram	0.99	0.09	2.54	3.87	1.80	6.66	1.24	0.34	2.39	3.69	0.90	7.72
Gereida	5.67	3.49	8.26	13.55	9.21	18.62	3.39	2.11	4.98	11.68	6.74	18.75
El Sunta	0.00	0.00	0.46	0.00	0.00	0.92	0.37	0.00	1.19	19.89	12.03	28.83
El Radoum	2.83	1.05	5.03	5.02	2.23	8.54	0.11	0.00	0.77	59.74	47.99	70.62
Tulus	1.19	0.00	3.97	5.52	1.87	10.78	6.38	2.47	17.36	29.87	21.40	45.07
Damso	0.44	0.00	1.38	4.61	2.02	7.73	0.43	0.00	1.63	27.23	13.30	50.22
Ed Elfursan	0.53	0.00	1.86	1.06	0.13	2.57	0.27	0.00	1.11	48.06	40.39	55.41
Kubum	3.93	1.98	6.23	5.35	3.12	7.99	1.25	0.47	2.23	20.95	16.08	27.84
Kateila	5.41	1.90	10.35	9.61	5.07	16.30	0.00	0.00	0.46	46.90	39.50	54.53
Rehaid Elbirdi	3.99	1.00	7.96	7.56	3.84	12.50	2.48	1.03	3.88	21.16	15.44	27.15
Um Dafoug	0.15	0.00	0.76	0.87	0.00	2.59	0.55	0.00	1.61	14.27	8.63	20.04
South Darfur State	4.11	0.01	9.53	8.47	1.10	15.85	2.68	0.01	5.95	30.55	18.66	42.43
Abu Jabra	4.22	2.41	6.67	9.05	4.39	14.66	1.87	0.53	3.86	50.40	39.94	60.07
Abu Karinka	2.98	1.29	4.88	22.85	14.72	30.67	2.96	1.64	4.84	42.11	30.80	53.17
Bahr El Arab	0.26	0.00	1.86	0.85	0.00	2.97	0.00	0.00	0.70	4.05	1.63	7.79
Adila	3.59	0.42	8.13	5.15	1.30	10.92	0.74	0.12	1.71	31.55	20.31	43.62

Table 34: Screening coverage using MUAC, GM / GMP coverage and IYCF counselling / messaging coverage by locality and by state

Location	MUAC screening in past month %			MUAC screening in past three months %			GM / GMP coverage %			IYCF Counselling or messaging Coverage %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ed Dain	5.17	2.25	9.30	12.09	6.97	18.01	5.72	3.25	8.61	34.99	26.00	43.76
Assalaya	2.78	1.04	5.06	6.02	3.09	9.99	0.00	0.00	0.67	45.06	37.94	50.79
El Firdous	3.54	1.22	6.91	26.24	13.90	40.39	7.73	3.37	12.63	52.26	37.75	64.24
Shia-ria	4.61	2.51	7.52	6.51	4.02	9.69	1.32	0.00	3.27	1.51	0.47	3.41
Yassin	4.49	2.33	7.12	8.53	5.41	12.04	0.95	0.16	2.04	20.20	14.65	26.64
East Darfur State	3.17	0.65	5.69	10.56	4.03	17.10	2.20	0.29	4.11	31.48	22.75	40.22
El Geneina	12.43	7.60	18.80	37.89	30.67	46.38	6.87	4.65	9.45	46.18	37.65	56.09
Habila	1.40	0.29	3.15	6.40	1.94	13.06	0.94	0.14	1.99	13.66	6.42	23.23
Kulbus	7.59	2.71	14.36	33.45	21.74	46.10	7.60	4.04	12.59	39.95	24.43	54.19
Beida	3.61	1.23	6.24	28.46	18.48	38.11	3.59	1.39	6.75	47.85	43.52	52.05
Foro Baranga	1.07	0.14	2.47	5.18	2.92	8.20	2.02	0.77	3.41	22.68	15.86	31.05
Kereneik	9.77	6.06	13.67	19.32	13.94	24.51	4.94	3.25	6.76	44.02	37.87	50.77
Sirba	2.60	1.08	4.38	12.30	7.41	17.94	2.61	1.35	4.46	37.19	26.28	47.90
Jebel Moon	3.92	1.41	7.26	23.87	16.39	30.49	12.87	4.59	23.92	42.46	29.91	56.06
West Darfur State	7.13	2.67	11.59	25.29	16.86	33.71	5.98	2.27	9.69	40.04	29.85	50.24
Zalingi	5.31	3.14	9.05	12.01	8.31	16.51	1.39	0.45	2.58	40.83	34.43	47.01
Wadi Salih	0.37	0.00	1.47	0.87	0.12	2.16	0.00	0.00	0.46	14.42	7.95	23.80
Mukjar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	1.23
Central Jebel Mara	8.04	3.70	12.96	22.71	14.59	30.53	3.46	0.93	6.83	12.50	4.54	24.35
North Jebel Mara	1.01	0.00	3.59	1.00	0.00	3.70	1.89	0.00	5.80	14.15	6.05	23.09
Bendasi	0.49	0.00	2.24	2.36	0.88	4.36	0.20	0.00	1.19	5.06	2.15	8.94
Nertiti	17.50	9.32	26.17	31.02	19.06	43.25	4.35	1.91	7.09	46.04	29.13	61.28
Azum	2.13	0.00	5.26	3.39	0.41	8.13	0.56	0.00	1.91	34.27	25.50	41.57
Um Dukhun	0.96	0.29	2.07	1.47	0.43	3.01	0.15	0.00	1.00	1.65	0.40	3.71
Central Darfur State	3.00	0.01	6.01	6.84	2.31	11.37	1.13	0.01	2.76	15.98	8.39	23.57

Spatial distribution of coverage of child nutrition screening activities

Low coverage of MUAC screening and GMP screening was nearly even throughout Sudan, with very small areas of moderate coverage in Red Sea state *(see Figure 135, Figure 137 and Figure 139)*. Moderate levels of IYCF counselling and message coverage was evenly spread throughout the country, with relatively high levels of coverage in some areas of Red Sea state and northern parts of Kassala state *(see Figure 141)*.

FIGURE 135:
MUAC screening in past month (raster)

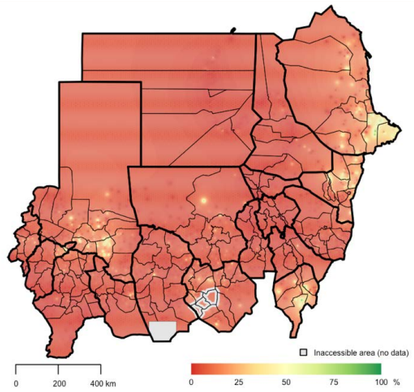


FIGURE 136:
MUAC screening in past month

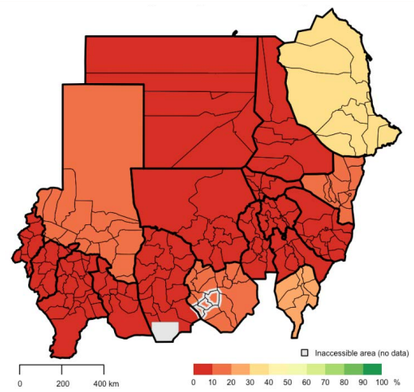


FIGURE 137:
MUAC screening in past three months (raster)

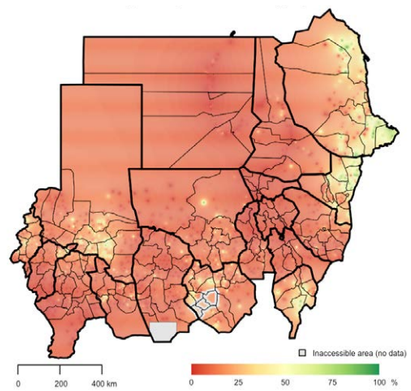


FIGURE 138:
MUAC screening in past three months

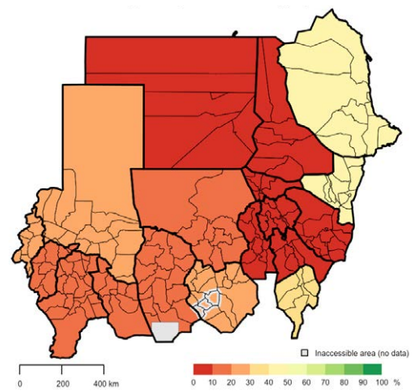


FIGURE 139:
Growth monitoring coverage (raster)

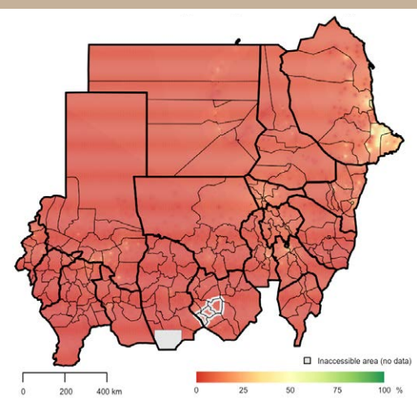


FIGURE 140:
Growth monitoring coverage

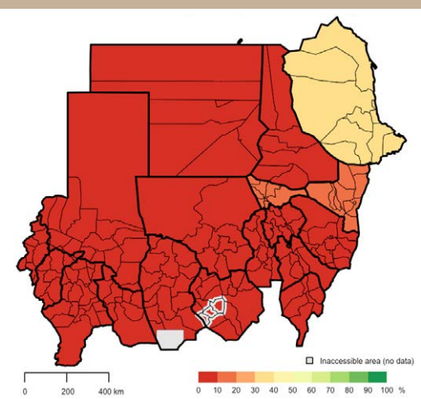


FIGURE 141:
IYCF counselling / messaging coverage (raster)

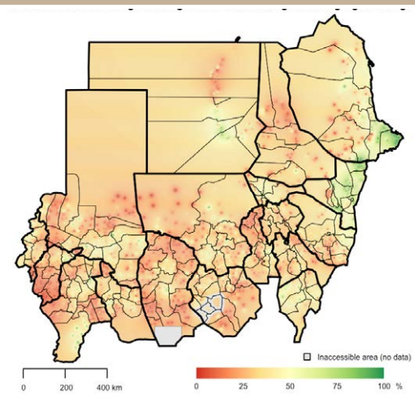
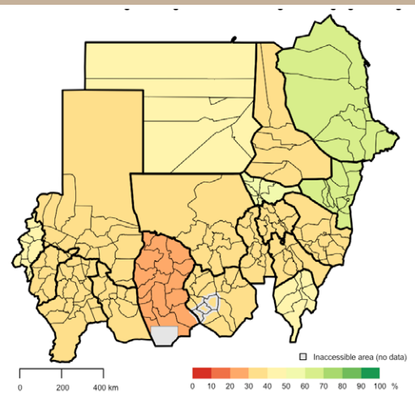


FIGURE 142:
IYCF counselling / messaging coverage



3.5 Child vitamin A supplementation coverage

Child vitamin A supplementation coverage average results

The proportion of children who had received vitamin A supplementation in the six months prior to the survey was 39.8 per cent (95 per cent CI: 30.0-49.6 per cent). South Kordofan state had the highest proportion of children who had received vitamin A supplementation, while River Nile and Sennar states had the lowest proportion *(see Figure 143)*. Only 34 per cent of localities achieved greater than 50 per cent vitamin A supplementation coverage of children. Table 35 and Table 36 present results by locality, by state and at the national level for vitamin A supplementation coverage of children.

FIGURE 143: Box plot of state and locality results for child vitamin A supplementation coverage

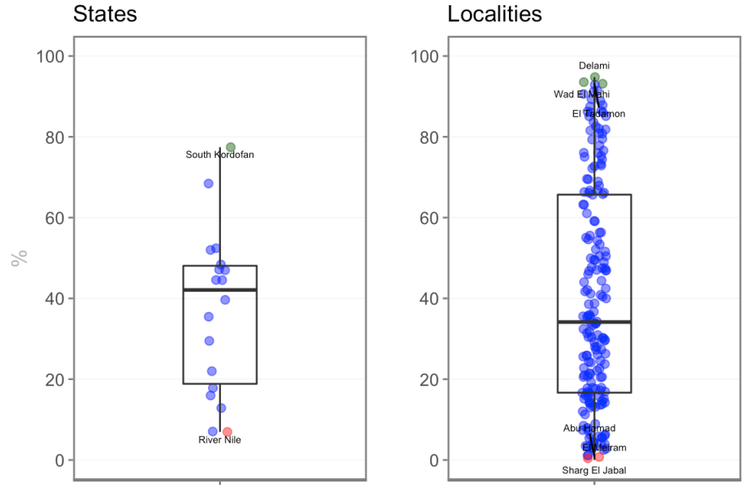


Table 35: Child vitamin A supplementation by state and national

	Child vitamin A supplementation		
State	**Estimate**	**95% LCL**	**95% UCL**
Al-Gadarif	35.46	22.75	48.17
Al-Gazeera	12.85	5.15	20.54
Blue Nile	52.43	42.84	62.01
Central Darfur	39.66	26.00	53.31
East Darfur	51.99	40.23	63.75
Kassala	68.42	60.30	76.54
Khartoum	46.97	37.55	56.38
North Darfur	48.39	37.44	59.34
North Kordofan	21.98	13.50	30.47
Northern	29.47	19.21	39.73
Red Sea	44.52	31.69	57.36
River Nile	6.95	1.97	11.93
Sennar	7.06	2.97	11.15
South Darfur	47.12	38.31	55.93
South Kordofan	77.43	66.43	88.42
West Darfur	44.55	33.67	55.43
West Kordofan	15.95	8.99	22.91
White Nile	17.81	11.63	24.00
Sudan	39.79	30.00	49.59

Table 36: Child vitamin A supplementation by locality and by state

	Child vitamin A supplementation		
Location	**Estimate**	**95% LCL**	**95% UCL**
Dongola	16.44	8.75	25.22
El Golid	35.82	25.43	45.90
Merwoe	33.18	19.86	46.39
El Daba	47.35	38.50	55.82
Halfa	38.46	25.10	51.96
Delgo	14.59	7.56	25.05
El Burgaig	13.82	8.16	21.22
Northern State	29.47	19.21	39.73
El Matama	1.57	0.29	4.13
Shendi	2.87	1.13	5.46
Abu Hamad	2.95	1.00	5.13

Table 36: Child vitamin A supplementation by locality and by state

Child vitamin A supplementation			
Location	**Estimate**	**95% LCL**	**95% UCL**
Barbar	11.93	4.35	20.14
El Damar	15.44	9.14	24.71
Atbara	2.01	0.76	3.88
El Buhaira	8.11	5.72	10.86
River Nile State	6.95	1.97	11.93
Khartoum	26.88	20.16	34.96
Bahri	60.35	52.35	68.02
Um Durman	66.71	57.22	76.91
Um Bada	21.06	11.95	30.56
Jebel Awlia	35.61	26.66	46.63
Sharg Elneel	66.76	57.73	75.97
Karrari	65.02	53.01	76.15
Khartoum State	46.97	37.55	56.38
Greater Medani	7.61	4.07	11.59
Ganub Elgazira	18.13	10.95	23.23
El Hassahisa	7.77	4.29	13.15
El Kamlin	7.11	3.07	13.63
Sharg El Gezira	22.55	12.17	34.56
Um Elqura	15.99	8.53	25.22
El Manaqil	15.54	6.83	25.57
El Qurashi	6.20	3.45	9.77
Al-Gazeera State	12.85	5.15	20.54
Sennar	3.62	1.86	6.19
Sharg Sennar	4.44	2.29	6.83
Sinja	14.13	10.21	18.17
Abu Hujar	19.50	12.06	27.40
El Dali	3.28	0.86	6.60
Es Suki	3.51	1.37	6.44
Ed Dinder	6.84	2.63	11.51
Sennar State	7.06	2.97	11.15
Ed Damazine	2.82	1.21	5.15
El Tadamon	93.38	87.52	97.43
El Roseiris	15.72	7.12	24.86
Baw	91.54	85.10	95.27
Geisan	83.68	66.86	95.87
El Kurmuk	85.04	63.14	98.63
Wad El Mahi	86.15	75.53	93.74

Table 36: Child vitamin A supplementation by locality and by state

Child vitamin A supplementation			
Location	**Estimate**	**95% LCL**	**95% UCL**
Blue Nile State	52.43	42.84	62.01
Kosti	26.92	18.26	35.59
Guli	15.74	10.10	21.42
Tendalti	23.91	15.77	32.20
Es Salam	24.50	18.91	29.80
Rabak	30.70	23.88	36.14
El Jabalain	20.61	15.18	27.34
El Diwaim	5.75	1.16	11.54
Um Rimta	3.12	1.57	5.26
El Gitaina	4.40	1.88	7.97
White Nile State	17.81	11.63	24.00
Port Sudan	64.96	52.61	75.83
Swakin	39.97	33.62	46.49
El Gonob Welawlaib	37.66	20.85	56.14
Sinkat	41.49	26.76	55.61
Haya	3.48	0.43	6.88
Dordieb	30.28	19.82	40.11
Tokar	82.06	71.28	89.16
Agig	72.11	56.94	83.67
Gabaot Elma-aadin	47.45	39.81	54.62
Halaeeb (accessible parts)	63.71	34.17	81.40
Red Sea State	44.52	31.69	57.36
Kassala Town	41.60	33.13	51.72
Refi Kassla	83.23	76.21	88.34
Rural Western Kassala	80.50	65.76	91.77
New Halfa	19.78	12.48	30.70
Refi Nahr Atbara	79.19	70.73	85.26
Rural Khashm Elgirba	39.91	27.99	53.28
Rural Wad Elhilaiw	85.47	72.80	93.74
Rural Aroma	91.63	86.71	96.46
Refi North Delta	85.80	75.35	93.15
Refi Hamashkureib	91.96	87.57	95.43
Rural Telkok	89.68	82.58	95.30
Kassala State	68.42	60.30	76.54
Gedaref Town	34.24	25.10	44.46
Middle Geddaref	32.60	16.55	46.38

Table 36: Child vitamin A supplementation by locality and by state

Child vitamin A supplementation			
Location	**Estimate**	**95% LCL**	**95% UCL**
Elbutana	16.03	9.15	23.32
El Fashaga	27.57	13.74	42.92
El Rahad	18.20	9.25	30.50
Gala-a El Nahal	40.41	26.50	58.95
El Fao	73.33	66.28	80.15
El Qureisha	64.61	49.19	76.11
El Mafaza	43.67	25.95	63.02
Basunda	28.64	22.42	33.91
Western Galabat	5.96	2.19	10.72
Eastern Galabat	29.23	20.52	36.85
Al-Gadarif State	35.46	22.75	48.17
Sheikan	18.63	13.91	24.60
Um Rawaba	25.66	15.17	36.65
Um Dam Haj Ahmed	29.88	17.16	40.79
El Rahad	24.06	17.44	32.07
Bara	17.07	9.91	25.90
Gharb Bara	15.69	9.26	23.57
Soudari	16.88	10.41	24.66
Gebrat El Sheikh	33.47	23.23	43.09
North Kordofan State	21.98	13.50	30.47
Kadugli	86.38	78.38	92.56
Reif Shargi	83.96	74.85	90.19
Dilling	81.72	74.17	88.32
El Quoz	71.83	63.52	80.05
Habila	69.39	55.50	81.28
Abassiya	73.58	58.69	84.77
El Rashad	87.77	81.11	92.51
Abu Jubaiha	77.02	62.93	88.77
El Tadamon	70.15	53.70	83.09
Talodi	82.76	67.77	90.10
Ghadeer	89.23	77.17	94.30
El Leri	77.82	68.77	85.34
Abu Karshola	71.11	56.73	81.07
Delami	94.52	89.86	97.97
South Kordofan State	77.43	66.43	88.42
Abu Zabad	31.62	23.20	41.08
ElKhiwai	21.30	15.20	27.96

Table 36: Child vitamin A supplementation by locality and by state

Child vitamin A supplementation			
Location	**Estimate**	**95% LCL**	**95% UCL**
Ghubaish	6.42	2.76	10.69
El Nuhud	16.42	10.39	22.47
El Idia	13.61	7.50	21.93
Wad Benda	8.75	5.36	12.57
Lagawa	5.79	3.11	9.12
Elsunut	25.71	18.16	31.84
Keilik	24.03	19.37	28.98
Es Salam	43.89	32.91	54.27
Babanusa	7.38	0.43	19.21
Abyei	11.30	1.57	25.32
El Dibab	8.52	3.43	15.30
El Meiram	0.57	0.00	2.99
West Kordofan State	15.95	8.99	22.91
El Fasher	46.52	38.38	55.01
Tawila	43.73	26.16	59.59
Melit	51.73	36.62	63.44
Um Kadada	35.34	30.45	39.96
Kebkabiya	90.71	82.30	95.54
Kutum	15.16	10.13	21.21
El Mahalha	14.56	7.91	21.26
Saraf Omra	48.66	36.49	61.03
El Serief	44.03	34.02	52.05
Dar Elsalam	57.66	52.33	62.46
Kelemando	76.29	70.40	81.32
El Tawisha	20.61	12.06	31.00
Um Baru	29.49	11.77	45.00
El Lait	69.68	62.23	76.42
ELkuma	79.83	59.77	91.01
El Tina	40.00	10.00	70.00
Kernoi	78.29	73.11	84.38
North Darfur State	48.39	37.44	59.34
Nyala South	73.60	67.02	79.07
Nyala North	76.00	67.65	84.01
Es Salam	47.13	41.27	51.98
El Wihda	47.22	42.12	53.87
Mershing	47.52	31.96	61.18
Beliel	64.38	58.28	69.99

Table 36: Child vitamin A supplementation by locality and by state

Child vitamin A supplementation			
Location	**Estimate**	**95% LCL**	**95% UCL**
Nitega	56.10	49.20	62.33
Sharg El Jabal (accessible parts)	0.00	0.00	0.00
Kas	25.23	15.77	34.36
Shattaya	42.62	31.94	52.62
Buram	55.57	45.41	65.36
Gereida	56.03	47.62	62.06
El Sunta	23.44	16.21	32.07
El Radoum	24.83	14.43	37.18
Tulus	42.93	31.35	51.03
Damso	25.46	15.86	36.22
Ed Elfursan	36.02	29.37	43.09
Kubum	49.60	42.98	55.60
Kateila	33.90	27.05	42.32
Rehaid Elbirdi	50.17	37.11	62.19
Um Dafoug	34.48	22.04	47.35
South Darfur State	47.12	38.31	55.93
Abu Jabra	70.48	58.43	81.44
Abu Karinka	51.85	44.03	60.46
Bahr El Arab	32.56	18.08	45.88
Adila	50.33	33.16	67.51
Ed Dain	75.37	67.28	83.15
Assalaya	47.53	40.62	54.39
El Firdous	75.95	68.46	83.52
Shia-ria	23.83	14.65	33.11
Yassin	54.77	44.15	66.77
East Darfur State	51.99	40.23	63.75
El Geneina	49.35	40.58	59.10
Habila	27.18	19.37	34.72
Kulbus	64.73	51.89	78.93
Beida	50.30	45.76	55.71
Foro Baranga	41.06	31.01	51.20
Kereneik	19.68	12.70	26.05
Sirba	29.34	19.62	41.48
Jebel Moon	55.76	40.57	70.74
West Darfur State	44.55	33.67	55.43
Zalingi	35.55	23.19	48.72

Table 36: Child vitamin A supplementation by locality and by state

Child vitamin A supplementation			
Location	**Estimate**	**95% LCL**	**95% UCL**
Wadi Salih	58.10	44.89	72.44
Mukjar	32.20	14.97	51.89
Central Jebel Mara	43.12	25.22	59.91
North Jebel Mara	8.16	2.61	16.94
Bendasi	36.04	21.59	52.80
Nertiti	85.17	76.20	92.61
Azum	70.21	56.93	80.13
Um Dukhun	25.15	16.96	34.15
Central Darfur State	39.66	26.00	53.31

Spatial distribution of vitamin A supplementation coverage

Coverage of vitamin A supplementation for children was generally low throughout Sudan, but with significant areas of high coverage in a number of areas: the southern parts of Red Sea state; most of Kassala state; most of Blue Nile state; central areas of Khartoum state; most of South Kordofan state; and parts of North, East, South and Central Darfur *(see Figure 144)*.

FIGURE 144:
Child: Vitamin A supplementation coverage (raster)

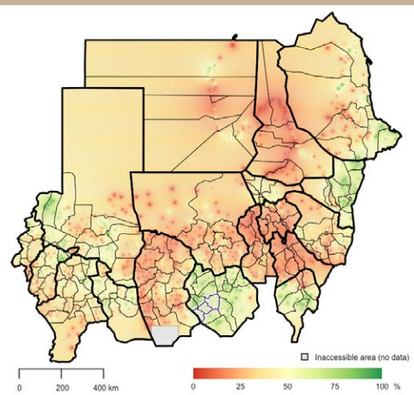
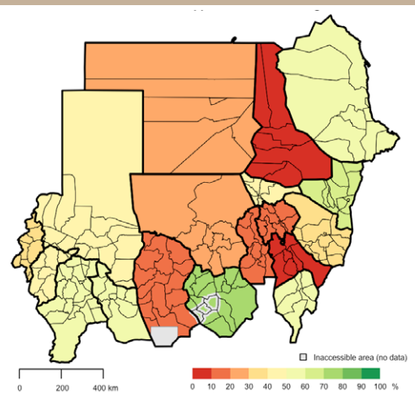


FIGURE 145:
Child: Vitamin A supplementation coverage



3.6 Maternal nutrition

To assess maternal nutrition, mid-upper-arm circumference, or MUAC, was used.[41] MUAC is predominantly an indicator of the loss of lean tissue mass.[42] Based on a collaborative study led by the WHO, cut-off values of less than 210 mm up to less than 230 mm were found to be significant risk factors for LBW in pregnant women. However, Ververs et al. (2013) recommend that the more expansive cut-off of 230 mm be used so as to identify the greatest number of at-risk pregnant women.

Maternal nutrition status is an important predictor of birth outcome, particularly low birth weight (LBW) (Ververs et al. 2013; Elshibly and Schmalisch 2008; Black et al. 2008; Christian et al. 2008)

3.6.1 Prevalence of maternal acute malnutrition

Maternal acute malnutrition average results

Maternal global acute malnutrition or GAM prevalence (MUAC < 210 mm, under the current definition) was relatively low, at 8.63 per cent (95 per cent CI: 3.7-13.6 per cent) for the whole country. However, maternal GAM prevalence based on the definition used in 2013 in the *S3M I* (MUAC < 230 mm), was higher at 16.31 per cent (95 per cent CI: 10.4-22.2 per cent). The majority of GAM cases were moderate for MAM (with MUAC between 210 mm and 185 mm) at a prevalence of 6.36 per cent (95 per cent CI: 1.0-11.7 per cent) of mothers in the country. Maternal severe acute malnutrition or SAM (MUAC < 185 mm) prevalence was 2.2 per cent (95 per cent CI: 0.1-4.3 per cent).

Across all of these acute undernutrition indicators, Red Sea state had the highest prevalence, significantly higher than all other state estimates. Khartoum state had the lowest GAM and MAM prevalence, and West Darfur state had the lowest SAM prevalence *(see Table 37)*.

Among localities, 38.4 per cent had more than 10 per cent of mothers with MUAC < 210 mm and 81.1 per cent had more than 10 per cent of mothers with MUAC < 230 mm, the two different thresholds for GAM. With regards to MAM and SAM distribution, 17.8 per cent had more than 10 per cent of carers with MUAC between 210 mm and 185 mm, and 3.8 per cent had more than 5 per cent of carers with MUAC < 185 mm.

Maternal GAM was a major problem in almost all localities in Red Sea state. Khartoum and Northern state localities had the lowest prevalence of maternal acute malnutrition *(see Figure 146)*. For GAM based on the definition used in 2013 in the *S3M I* of MUAC less than 230 mm, Red Sea state had the highest prevalence compared to all other other states, while Northern state had the lowest prevalence.

Maternal acute malnutrition comparison between S3M I and S3M II

Those results were in line with S3M I results, in which the highest levels of maternal malnutrition were found in the eastern part of Red Sea state (excluding Port Sudan city), with over 50 per cent of mothers with a MUAC of less than 230 mm, followed by North Darfur state, Blue Nile state, and South Kordofan state. In comparison, *S3M II* results showed that the highest maternal acute malnutrition prevelance was Kassala and Red Sea states, followed by North Darfur, South Kurdofan, and West Kurdofan states.

Table 37 and Table 38 present results per state, per locality and at the national level for estimates of maternal acute undernutrition in Sudan.

[41] Ververs, Mija-tesse, et al., 'Which Anthropometric Indicators Identify a Pregnant Woman as Acutely Malnourished and Predict Adverse Birth Outcomes in the Humanitarian Context?', *PLOS Currents*, 7 June 2013, <https://doi.org/10.1371/currents.dis.54a8b618c1bc031ea140e3f2934599c8>.

[42] Cogill, Bruce, *Anthropometric Indicators Measurement Guide,* Food and Nutrition Technical Assistance Project, U.S. Agency for International Development, Washington, D.C., 2001.

FIGURE 146: Box plot of locality results of maternal acute undernutrition indicators

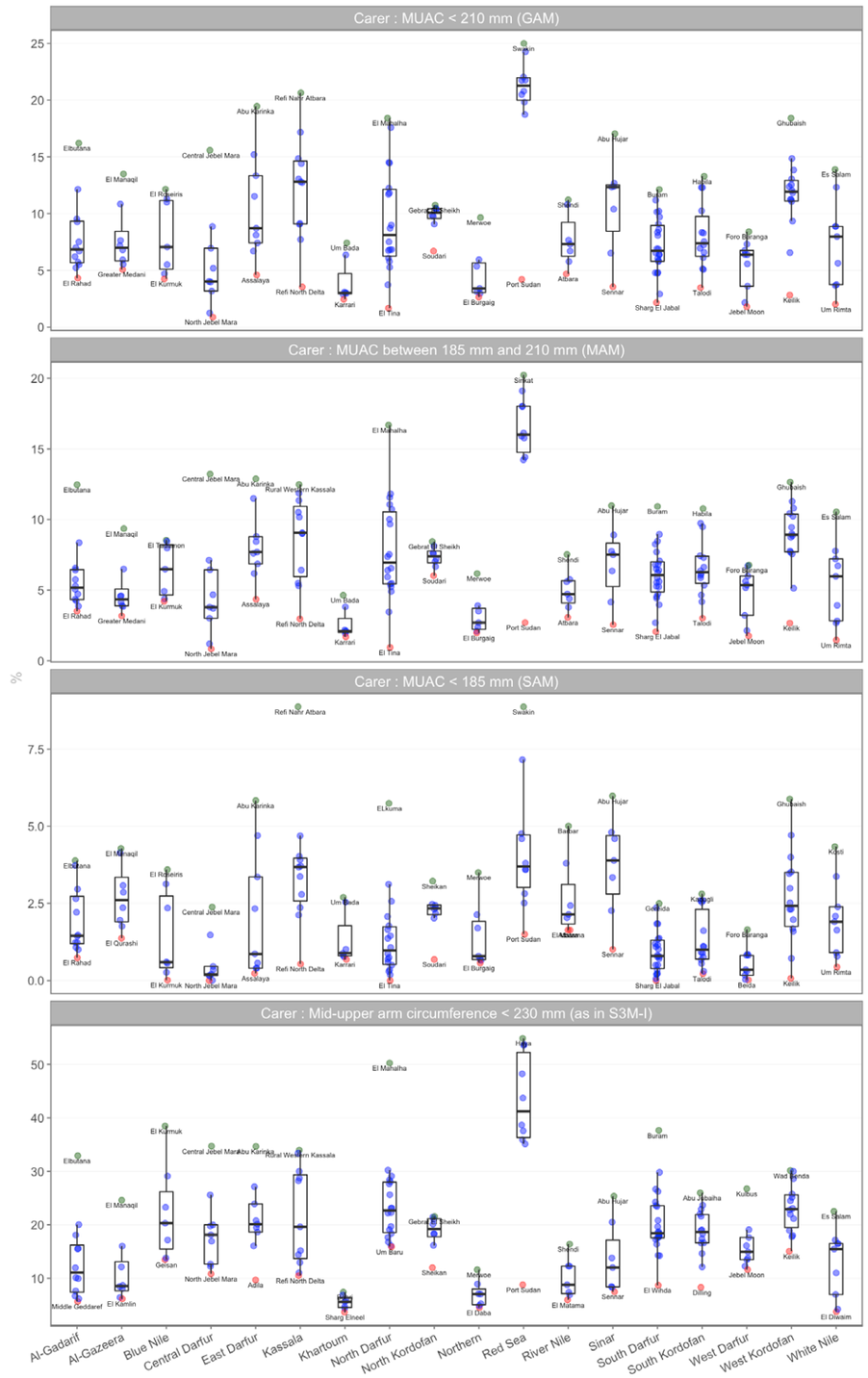


Table 37: Maternal acute undernutrition by state and national

State	Mean MUAC (mm)			MUAC < 210 mm GAM %			MUAC 185 mm - 210 mm MAM %			MUAC < 185 mm SAM %			MUAC < 230 mm as in S3M-I %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	270.04	263.61	276.48	7.71	3.78	11.64	5.70	1.42	9.98	1.92	0.22	3.63	12.03	6.60	17.46
Al-Gazeera	281.81	271.24	292.37	9.55	1.81	17.28	6.17	0.01	14.33	3.34	0.28	6.41	14.53	7.36	21.70
Blue Nile	256.06	249.63	262.50	8.83	5.26	12.40	6.70	2.68	10.71	2.03	0.45	3.62	22.48	16.19	28.78
Central Darfur	250.57	245.59	255.55	6.08	1.06	11.09	5.21	0.01	10.52	0.81	0.01	2.41	19.24	11.91	26.57
East Darfur	253.53	248.43	258.63	10.24	5.22	15.26	8.00	2.51	13.48	2.11	0.01	4.41	21.03	14.99	27.07
Kassala	262.93	256.06	269.79	12.38	7.79	16.96	8.52	3.27	13.76	3.76	1.31	6.22	20.71	15.23	26.19
Khartoum	305.31	296.84	313.79	4.60	1.52	7.68	2.92	0.01	6.26	1.60	0.01	3.22	5.42	2.14	8.71
North Darfur	251.49	246.06	256.93	8.82	3.94	13.70	7.48	2.43	12.52	1.22	0.01	2.88	23.86	15.74	31.97
North Kordofan	263.86	257.54	270.18	9.69	6.15	13.23	7.27	3.35	11.19	2.36	0.76	3.96	17.18	12.53	21.83
Northern	290.70	283.33	298.06	5.21	1.95	8.47	3.51	0.01	7.27	1.59	0.01	3.32	7.26	3.48	11.04
Red Sea	245.91	239.30	252.52	18.15	10.92	25.38	14.60	7.01	22.19	3.43	0.48	6.38	40.16	32.09	48.24
River Nile	283.60	275.17	292.02	7.97	3.75	12.19	5.25	0.49	10.02	2.65	0.59	4.71	10.42	6.04	14.81
Sennar	277.72	269.90	285.53	10.28	5.50	15.06	6.64	1.06	12.22	3.46	0.62	6.30	13.88	8.66	19.10
South Darfur	254.64	247.26	262.02	7.65	2.27	13.03	6.39	0.87	11.92	1.09	0.01	2.55	20.25	12.74	27.76
South Kordofan	256.53	251.14	261.91	8.00	4.17	11.82	6.56	2.38	10.73	1.29	0.01	2.63	18.81	13.66	23.96
West Darfur	253.99	249.35	258.64	5.87	2.71	9.02	5.08	1.67	8.48	0.67	0.01	1.60	15.35	10.25	20.45
West Kordofan	253.24	247.19	259.29	12.20	7.07	17.33	9.56	3.90	15.21	2.58	0.19	4.96	24.21	17.54	30.87
White Nile	278.84	271.35	286.33	7.96	3.82	12.10	5.51	0.97	10.06	2.40	0.45	4.34	11.65	7.57	15.73
Sudan	271.65	264.12	279.19	8.63	3.66	13.60	6.36	1.03	11.69	2.18	0.08	4.28	16.31	10.38	22.24

Table 38: Maternal acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 210 mm GAM %			MUAC 185 mm - 210 mm MAM %			MUAC < 185 mm SAM %			MUAC < 230 mm as in S3M-I %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	292.86	285.06	300.32	4.87	1.82	8.36	3.27	-0.42	7.43	1.56	0.43	3.42	6.62	4.18	9.64
El Golid	290.01	284.60	296.07	5.40	2.66	8.58	3.63	0.40	7.06	1.73	0.72	3.22	4.96	2.35	8.34
Merwoe	277.25	267.51	286.84	9.93	6.19	15.33	6.31	1.71	12.20	3.60	1.28	6.64	12.22	7.51	18.15
El Daba	301.90	295.58	308.36	3.03	1.30	6.31	2.16	-0.12	5.46	0.79	0.20	2.32	4.55	1.66	8.46
Halfa	292.80	286.27	298.44	2.90	1.15	4.86	2.21	0.35	4.41	0.64	0.16	1.35	6.71	3.88	10.21

Table 38: Maternal acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 210 mm GAM %			MUAC 185 mm - 210 mm MAM %			MUAC < 185 mm SAM %			MUAC < 230 mm as in S3M-I %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Delgo	287.88	281.94	293.88	3.67	1.67	6.59	2.82	0.41	5.96	0.86	0.24	2.00	8.57	5.89	12.00
El Burgaig	294.40	288.44	302.29	2.62	1.00	5.85	1.93	0.07	5.07	0.55	0.13	1.66	6.75	3.77	9.71
Northern State	290.70	283.33	298.06	5.21	1.95	8.47	3.51	0.01	7.27	1.59	0.01	3.32	7.26	3.48	11.04
El Matama	286.84	281.76	293.31	6.23	3.27	10.26	4.49	0.33	8.55	1.90	0.53	3.93	7.19	4.31	10.58
Shendi	269.23	261.54	278.11	11.24	7.05	17.41	7.80	2.34	13.83	3.55	1.85	6.84	16.46	11.59	23.26
Abu Hamad	277.53	269.52	286.73	7.31	2.95	12.38	5.26	0.59	9.59	2.15	0.52	4.77	7.65	3.60	12.54
Barbar	284.70	273.00	295.88	10.70	5.32	14.70	5.93	-0.13	11.09	4.96	1.75	7.72	13.20	8.38	19.19
El Damar	292.43	285.49	299.93	5.93	3.24	9.47	3.91	0.59	7.84	1.87	0.83	3.76	8.00	5.12	10.74
Atbara	298.68	289.85	307.60	5.27	2.70	8.46	3.40	0.54	6.88	1.84	0.85	3.39	7.29	4.56	10.30
El Buhaira	269.72	264.01	274.35	6.89	2.95	11.00	5.20	0.61	9.99	1.72	0.54	3.60	12.53	8.21	17.84
River Nile State	283.60	275.17	292.02	7.97	3.75	12.19	5.25	0.49	10.02	2.65	0.59	4.71	10.42	6.04	14.81
Khartoum	313.42	304.69	321.37	3.05	1.31	6.90	1.93	-0.43	6.01	0.95	0.33	2.73	5.91	3.26	8.63
Bahri	312.29	302.59	320.30	3.32	1.35	7.16	2.23	-0.56	6.18	1.04	0.30	3.34	6.59	2.70	12.02
Um Durman	300.46	292.27	308.82	3.01	1.36	5.75	2.20	0.38	4.91	0.75	0.18	1.96	5.80	3.70	8.68
Um Bada	294.80	286.65	302.97	7.78	4.66	11.70	4.98	1.02	9.29	2.88	1.14	5.46	5.44	2.43	9.17
Jebel Awlia	304.53	295.75	314.32	6.46	3.55	9.15	3.92	0.55	7.08	2.55	1.13	4.28	4.85	2.33	7.84
Sharg Elneel	308.02	300.68	315.47	2.78	0.97	5.67	2.00	-0.22	4.78	0.71	0.18	1.86	3.89	1.43	7.46
Karrari	307.33	297.75	316.51	3.50	1.40	7.18	2.13	-0.54	6.01	1.08	0.31	3.03	6.25	3.16	9.99
Khartoum State	305.31	296.84	313.79	4.60	1.52	7.68	2.92	0.01	6.26	1.60	0.01	3.22	5.42	2.14	8.71
Greater Medani	295.11	287.27	305.07	5.36	2.62	9.01	3.50	0.19	7.32	1.76	0.49	3.66	6.63	3.52	11.20
Ganub Elgazira	293.09	283.26	302.73	7.48	3.55	12.54	4.46	-0.64	9.96	2.95	1.04	5.78	7.64	3.86	13.23
El Hassahisa	288.34	277.03	298.93	8.57	4.59	14.66	4.90	-0.30	11.24	3.55	1.39	6.71	11.39	6.44	16.30
El Kamlin	292.59	281.08	304.70	6.11	2.88	9.94	4.13	0.60	8.57	1.94	0.63	3.65	6.04	3.16	9.92
Sharg El Gezira	286.31	277.70	295.32	7.65	3.37	11.41	5.06	0.05	9.09	2.57	0.78	5.07	11.95	7.89	16.57
Um Elqura	276.21	269.96	281.47	11.27	7.60	15.47	6.84	2.23	11.62	4.27	2.40	7.13	15.00	10.95	19.32
El Manaqil	259.90	247.31	271.03	18.62	9.22	28.46	11.85	1.02	23.52	6.20	2.58	12.32	31.38	18.76	47.04
El Qurashi	279.35	273.52	286.91	5.63	2.50	11.35	4.18	0.54	10.06	1.36	0.38	3.89	8.84	5.45	12.86
Al-Gazeera State	281.81	271.24	292.37	9.55	1.81	17.28	6.17	0.01	14.33	3.34	0.28	6.41	14.53	7.36	21.70
Sennar	294.92	287.91	302.01	4.34	2.04	7.69	2.98	0.25	6.47	1.34	0.46	3.16	8.43	5.69	11.61
Sharg Sennar	263.08	254.22	271.46	12.80	9.08	17.61	9.06	3.72	14.76	3.60	1.85	6.78	20.61	15.38	27.00
Sinja	292.38	285.35	299.67	6.39	2.39	11.29	4.18	-1.30	9.00	2.15	0.74	5.57	8.07	5.16	11.76

Table 38: Maternal acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 210 mm GAM %			MUAC 185 mm - 210 mm MAM %			MUAC < 185 mm SAM %			MUAC < 230 mm as in S3M-I %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Hujar	263.54	254.47	272.01	15.76	9.70	21.31	9.93	2.72	17.18	5.54	2.42	9.37	23.29	17.74	29.59
El Dali	267.20	258.18	275.37	13.83	9.05	18.25	8.94	3.77	13.75	4.88	2.90	7.40	16.23	10.17	24.64
Es Suki	279.34	273.05	285.98	12.17	7.60	16.76	7.16	1.90	12.39	4.89	2.48	7.59	10.93	5.66	17.68
Ed Dinder	269.48	260.78	278.43	11.33	6.36	17.02	7.11	0.95	14.20	3.91	1.23	8.26	14.44	8.57	20.81
Sennar State	277.72	269.90	285.53	10.28	5.50	15.06	6.64	1.06	12.22	3.46	0.62	6.30	13.88	8.66	19.10
Ed Damazine	270.65	262.25	280.30	11.82	8.87	14.94	7.56	3.99	11.49	4.17	2.19	6.52	17.46	12.35	22.00
El Tadamon	257.10	251.78	262.17	10.90	5.27	15.59	8.36	2.40	13.71	2.23	0.51	4.60	17.37	12.66	23.82
El Roseiris	259.75	253.86	264.94	11.81	8.00	16.60	8.62	3.56	13.61	3.16	1.64	5.38	22.72	17.22	28.61
Baw	248.04	243.64	252.56	6.94	3.60	11.15	6.44	2.91	10.72	0.40	0.07	1.44	29.29	23.36	35.07
Geisan	251.27	245.77	256.01	4.81	2.31	7.90	4.58	2.03	7.59	0.27	0.02	0.82	13.93	9.79	19.72
El Kurmuk	235.26	231.36	240.55	4.04	0.23	9.77	3.93	0.18	9.77	0.01	0.00	0.48	37.99	27.85	48.62
Wad El Mahi	254.76	248.97	260.03	6.64	3.83	11.53	5.79	2.86	10.89	0.83	0.24	2.24	19.03	12.10	25.46
Blue Nile State	256.06	249.63	262.50	8.83	5.26	12.40	6.70	2.68	10.71	2.03	0.45	3.62	22.48	16.19	28.78
Kosti	271.96	264.40	279.50	11.38	8.14	15.50	7.17	2.94	11.81	4.11	2.40	6.43	16.22	11.88	20.65
Guli	261.64	256.00	267.07	9.87	6.34	14.03	7.63	3.52	12.51	2.46	0.86	4.40	18.23	13.80	23.28
Tendalti	271.09	264.17	279.27	8.47	4.40	13.00	6.21	1.23	10.99	2.28	0.65	4.88	14.97	9.92	20.05
Es Salam	252.47	248.12	257.23	13.80	8.87	18.42	10.43	4.38	15.62	3.15	1.04	5.64	23.05	18.59	28.89
Rabak	285.39	277.64	292.35	6.39	4.01	10.40	4.43	1.42	7.71	1.94	0.91	3.66	10.14	7.27	12.72
El Jabalain	270.82	261.97	280.35	11.42	6.59	15.87	7.62	1.79	12.40	4.00	1.57	6.61	13.04	8.29	18.47
El Diwaim	286.44	280.07	293.04	4.30	1.54	8.56	3.22	0.09	7.16	0.99	0.22	2.66	4.30	1.96	6.91
Um Rimta	303.50	293.43	313.43	2.04	0.69	5.05	1.40	-0.65	4.89	0.49	0.08	2.06	6.91	3.62	11.53
El Gitaina	293.91	286.32	300.62	4.72	1.64	8.43	3.31	0.26	7.26	1.32	0.35	2.87	5.69	3.25	8.90
White Nile State	278.84	271.35	286.33	7.96	3.82	12.10	5.51	0.97	10.06	2.40	0.45	4.34	11.65	7.57	15.73
Port Sudan	290.16	282.85	299.53	5.19	2.41	9.89	3.55	-0.44	8.30	1.53	0.43	4.26	10.73	6.10	15.36
Swakin	245.04	239.25	250.11	24.15	17.25	27.68	15.92	8.43	21.39	8.08	4.34	11.00	38.14	31.84	44.16
El Gonob Welawlaib	243.12	238.00	248.38	18.42	14.16	24.46	13.73	9.21	19.76	4.89	2.86	7.34	33.86	28.22	39.94
Sinkat	228.09	223.09	233.03	23.59	15.86	33.52	19.69	10.54	30.51	3.04	0.98	7.70	52.80	46.15	60.01
Haya	229.62	223.85	237.08	21.87	13.76	29.83	18.87	10.98	27.18	2.82	0.81	5.78	55.09	45.06	64.09
Dordieb	234.73	229.10	240.48	19.96	9.89	30.20	17.00	6.63	27.74	2.89	0.35	7.83	47.44	39.40	56.75
Tokar	236.89	231.24	243.22	21.74	16.12	29.27	17.16	10.75	25.16	4.50	1.73	9.85	46.44	39.57	55.46
Agig	237.52	232.21	243.21	21.12	14.30	25.94	16.07	8.69	22.27	4.59	1.75	7.90	39.96	31.57	49.58
Gabaot Elma-aadin	247.36	238.28	253.93	21.42	14.17	27.21	14.02	4.57	21.04	7.29	3.44	12.53	34.95	26.48	45.55
Halaeeb (accessible parts)	238.32	230.38	251.30	18.58	8.87	26.93	15.29	4.81	24.36	3.15	0.44	8.12	45.83	29.10	57.78

Table 38: Maternal acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 210 mm GAM %			MUAC 185 mm - 210 mm MAM %			MUAC < 185 mm SAM %			MUAC < 230 mm as in S3M-I %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Red Sea State	245.91	239.30	252.52	18.15	10.92	25.38	14.60	7.01	22.19	3.43	0.48	6.38	40.16	32.09	48.24
Kassala Town	272.50	266.85	277.44	8.87	5.27	13.06	6.01	1.79	10.92	2.96	1.04	5.55	11.07	7.76	14.50
Refi Kassla	261.13	255.98	266.09	13.33	10.30	17.13	8.94	5.37	13.02	4.30	2.46	6.54	20.80	16.73	25.23
Rural Western Kassala	245.12	240.98	249.81	17.10	12.53	22.42	12.56	6.38	18.57	4.72	2.60	7.73	34.33	27.97	40.75
New Halfa	280.26	268.79	292.05	10.32	6.25	16.17	6.04	0.99	12.35	4.27	2.05	7.58	14.95	9.14	20.72
Refi Nahr Atbara	256.27	248.33	264.06	20.67	14.36	29.23	11.71	2.94	21.84	8.54	4.50	14.35	33.12	26.47	40.86
Rural Khashm Elgirba	279.91	270.42	289.67	7.67	4.69	11.84	5.47	1.63	9.74	2.20	0.95	4.76	12.58	7.75	19.51
Rural Wad Elhilaiw	250.45	245.77	254.53	14.18	10.70	18.20	11.09	6.45	15.80	2.99	1.28	6.11	29.38	24.07	34.51
Rural Aroma	246.68	240.95	252.55	15.37	10.75	21.08	12.18	7.05	18.19	3.09	1.27	6.11	35.29	26.57	42.44
Refi North Delta	272.28	265.98	279.38	4.10	1.30	7.62	3.26	0.24	6.92	0.69	0.08	2.02	10.30	6.28	15.00
Refi Hamashkureib	259.74	253.80	267.67	12.42	7.61	16.17	9.07	3.46	13.20	3.43	1.05	5.46	15.54	9.97	21.32
Rural Telkok	250.07	245.45	254.22	14.03	8.87	18.31	10.29	4.38	14.93	3.76	1.57	5.74	27.97	22.00	35.30
Kassala State	262.93	256.06	269.79	12.38	7.79	16.96	8.52	3.27	13.76	3.76	1.31	6.22	20.71	15.23	26.19
Gedaref Town	273.61	267.10	281.81	9.24	5.52	14.08	6.33	2.10	11.08	3.03	1.49	5.13	9.52	6.21	13.21
Middle Geddaref	283.01	274.99	292.25	7.08	3.60	11.03	4.66	0.52	9.07	2.27	0.60	4.46	5.64	2.43	10.37
Elbutana	249.93	242.60	257.31	15.94	10.60	21.64	12.20	5.79	18.10	3.76	1.96	6.54	32.82	23.06	43.07
El Fashaga	274.61	268.51	280.34	5.78	2.15	10.43	4.54	0.48	9.56	1.20	0.20	3.30	6.29	3.11	10.38
El Rahad	273.93	269.26	279.12	4.43	1.91	7.26	3.62	0.90	6.61	0.76	0.23	1.78	6.70	3.55	10.53
Gala-a El Nahal	264.50	258.24	271.57	5.31	2.89	9.09	4.45	1.73	7.95	0.77	0.25	2.29	13.03	7.93	18.51
El Fao	264.80	259.48	269.73	7.48	4.74	11.89	5.86	2.70	10.49	1.36	0.65	3.21	14.68	10.09	20.27
El Qureisha	269.97	263.80	278.26	4.64	1.70	8.87	3.72	0.77	8.00	0.82	0.10	3.13	11.97	7.84	16.16
El Mafaza	261.15	255.33	267.46	5.98	2.70	9.87	4.99	1.47	9.21	0.77	0.16	2.19	14.68	8.48	20.96
Basunda	271.73	263.30	279.76	10.11	5.64	15.18	7.09	1.68	12.66	2.95	1.14	5.86	12.50	7.05	21.96
Western Galabat	284.26	278.00	292.51	5.59	2.73	8.87	3.97	0.87	7.50	1.53	0.51	3.31	7.46	4.11	12.07
Eastern Galabat	262.65	257.79	267.54	11.64	7.11	16.63	8.14	3.00	13.62	3.41	1.59	5.98	18.18	12.67	23.80

Table 38: Maternal acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 210 mm GAM %			MUAC 185 mm - 210 mm MAM %			MUAC < 185 mm SAM %			MUAC < 230 mm as in S3M-I %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif State	270.04	263.61	276.48	7.71	3.78	11.64	5.70	1.42	9.98	1.92	0.22	3.63	12.03	6.60	17.46
Sheikan	272.93	267.70	278.58	9.65	7.42	12.07	6.62	4.18	9.30	3.01	1.85	4.17	12.94	10.16	16.09
Um Rawaba	267.31	261.47	273.39	8.87	5.72	11.65	6.61	3.30	10.21	2.15	1.09	3.80	16.09	12.23	20.36
Um Dam Haj Ahmed	260.40	252.34	269.04	9.47	5.18	14.03	7.56	3.12	11.71	1.84	0.79	3.87	17.85	12.55	23.22
El Rahad	262.65	256.41	269.66	11.70	7.06	16.38	8.30	3.18	13.16	3.40	0.89	6.19	19.32	14.39	23.97
Bara	260.15	254.47	266.34	10.27	6.50	14.03	7.90	3.70	12.51	2.23	0.91	4.06	20.12	13.80	25.20
Gharb Bara	257.40	252.82	262.20	10.48	7.23	14.28	8.29	4.42	12.09	2.29	1.00	4.25	22.41	17.07	27.61
Soudari	254.98	250.22	262.10	8.30	4.59	12.75	7.07	3.36	11.87	1.05	0.27	2.82	17.52	13.38	22.80
Gebrat El Sheikh	257.81	251.81	263.95	10.86	6.69	14.03	8.33	3.81	12.29	2.31	1.02	3.97	20.71	14.95	26.86
North Kordofan State	263.86	257.54	270.18	9.69	6.15	13.23	7.27	3.35	11.19	2.36	0.76	3.96	17.18	12.53	21.83
Kadugli	267.33	262.31	273.25	10.11	7.16	13.20	7.24	4.00	11.01	2.81	1.32	4.57	16.24	11.75	20.53
Reif Shargi	253.29	248.54	258.38	7.78	3.14	11.41	6.64	1.72	10.38	1.09	0.17	2.56	19.83	13.75	25.88
Dilling	266.29	260.21	273.30	3.97	1.36	9.52	3.43	0.26	9.19	0.47	0.05	2.74	6.83	2.37	11.87
El Quoz	255.42	249.27	261.08	4.20	1.91	7.90	3.89	1.48	7.59	0.33	0.04	1.28	16.83	11.24	23.13
Habila	252.76	248.34	257.87	15.03	10.03	18.95	11.33	5.54	15.92	3.52	1.10	6.97	26.37	20.74	31.84
Abassiya	260.98	256.30	265.19	8.04	5.12	11.70	6.35	3.26	10.41	1.61	0.63	2.87	14.55	10.26	19.76
El Rashad	254.01	249.84	259.05	8.38	4.58	12.47	7.44	2.71	11.47	1.09	0.25	2.70	18.53	13.46	23.39
Abu Jubaiha	245.84	240.33	252.17	12.00	7.51	16.33	10.20	5.40	14.86	1.63	0.43	4.36	30.04	24.23	36.66
El Tadamon	258.07	252.79	265.35	5.51	1.88	10.46	4.83	0.93	9.82	0.49	0.04	2.08	16.83	11.31	23.30
Talodi	258.26	252.77	264.77	4.20	0.42	11.65	3.61	-0.60	10.90	0.31	0.00	2.41	12.40	5.88	20.49
Ghadeer	254.43	248.30	261.33	12.04	7.54	17.61	9.39	3.88	15.17	2.59	0.98	5.96	23.67	17.95	29.53
El Leri	257.42	253.05	261.49	7.10	3.91	11.40	6.02	2.36	10.72	1.04	0.26	2.52	18.06	13.06	22.76
Abu Karshola	251.61	248.69	255.31	6.58	4.09	11.04	5.97	3.34	10.32	0.62	0.23	1.53	21.41	17.02	26.18
Delami	252.30	244.72	258.50	5.07	1.90	10.87	4.72	1.32	10.68	0.31	0.04	1.58	17.03	9.91	26.75
South Kordofan State	256.53	251.14	261.91	8.00	4.17	11.82	6.56	2.38	10.73	1.29	0.01	2.63	18.81	13.66	23.96
Abu Zabad	256.34	249.75	263.21	11.66	7.24	16.12	8.78	3.93	13.99	2.80	1.16	5.13	21.69	15.91	28.12
ElKhiwai	256.56	247.66	265.37	15.58	9.97	19.87	11.36	5.26	16.56	4.20	1.83	6.74	25.75	19.06	34.17
Ghubaish	251.67	245.76	257.37	16.76	10.36	22.81	12.00	4.17	18.81	4.66	1.64	8.45	26.35	19.59	33.61
El Nuhud	248.63	244.08	253.18	12.38	8.87	16.84	10.74	5.92	15.06	1.85	0.67	3.70	23.01	17.54	29.21
El Idia	254.10	249.30	259.52	9.39	6.63	13.19	7.71	4.70	11.65	1.60	0.73	3.10	21.90	16.85	27.29
Wad Benda	245.45	240.16	250.63	13.05	7.66	19.09	10.73	5.37	17.13	2.17	0.51	4.51	30.86	24.52	38.20

Table 38: Maternal acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 210 mm GAM %			MUAC 185 mm - 210 mm MAM %			MUAC < 185 mm SAM %			MUAC < 230 mm as in S3M-I %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Lagawa	251.35	244.28	258.14	13.61	8.32	19.54	10.14	3.86	17.04	3.37	1.15	7.09	30.42	24.07	37.79
Elsunut	250.76	245.25	256.33	14.03	6.89	20.91	10.51	3.52	18.03	2.83	0.46	6.74	27.34	18.98	34.65
Keilik	257.53	252.83	261.63	2.43	0.35	7.15	2.20	0.11	7.15	0.08	0.00	0.91	15.57	11.62	19.90
Es Salam	267.60	261.50	273.36	11.00	7.09	14.34	7.68	3.51	11.30	3.29	1.65	5.28	17.93	14.02	22.50
Babanusa	256.14	250.45	262.62	11.06	7.75	14.84	8.96	5.41	13.12	2.13	0.96	3.68	19.31	14.92	24.84
Abyei	254.63	250.51	258.49	11.72	7.45	15.96	9.03	5.07	13.59	2.49	1.12	4.45	26.21	20.09	32.57
El Dibab	257.35	248.05	267.13	12.95	6.67	20.59	9.44	1.58	17.34	3.33	0.79	7.04	24.87	17.11	33.91
El Meiram	261.31	254.84	268.25	5.85	0.78	18.06	4.73	-3.56	16.44	0.85	0.01	7.61	17.59	11.57	24.76
West Kordofan State	253.24	247.19	259.29	12.20	7.07	17.33	9.56	3.90	15.21	2.58	0.19	4.96	24.21	17.54	30.87
El Fasher	262.52	256.66	269.32	8.87	6.30	12.65	7.25	3.47	11.10	1.79	0.80	3.60	18.19	15.22	21.43
Tawila	256.48	250.12	263.63	5.04	2.28	9.23	4.46	1.61	8.65	0.49	0.07	2.01	14.45	9.31	20.83
Melit	244.18	240.55	247.99	5.75	1.97	10.61	5.52	1.67	10.48	0.18	0.01	0.90	27.14	21.36	34.24
Um Kadada	242.78	239.33	246.24	12.20	8.19	16.76	10.74	6.48	15.35	1.27	0.53	2.70	30.21	25.34	35.60
Kebkabiya	252.14	248.43	255.21	3.97	1.50	7.06	3.75	1.24	6.96	0.20	0.02	0.73	18.54	13.83	23.50
Kutum	250.04	246.44	253.47	5.42	2.84	8.30	5.01	2.39	8.00	0.35	0.07	1.19	19.22	15.28	23.47
El Mahalha	233.50	228.76	237.84	17.61	12.04	24.27	15.82	9.37	22.41	1.84	0.48	4.68	49.19	40.85	56.67
Saraf Omra	252.02	247.24	257.74	7.81	4.71	11.18	6.89	3.69	10.11	0.86	0.27	2.15	22.30	15.42	28.67
El Serief	250.18	247.00	253.70	12.07	7.59	16.33	9.92	4.50	14.63	1.90	0.71	4.12	27.20	21.64	33.65
Dar Elsalam	244.56	240.03	249.95	10.30	6.36	15.81	9.18	5.14	14.67	0.97	0.23	2.54	29.30	23.44	35.50
Kelemando	247.89	243.92	253.10	13.05	7.67	18.42	10.77	5.17	16.46	2.15	0.67	4.87	26.43	19.53	34.57
El Tawisha	252.70	248.32	256.95	11.73	7.06	15.76	9.49	4.43	13.78	2.06	0.63	4.38	22.96	18.37	28.66
Um Baru	253.68	249.13	260.99	4.84	1.16	12.51	4.28	-0.30	11.90	0.26	0.01	4.51	17.91	10.78	26.93
El Lait	258.04	251.76	265.18	7.66	3.14	13.49	6.29	1.19	12.38	1.17	0.23	4.19	17.52	12.74	24.15
ELkuma	255.00	244.58	262.72	17.18	7.49	25.02	11.33	-0.53	21.19	5.48	1.27	12.23	27.27	18.67	37.52
El Tina	249.67	236.64	262.71	1.66	0.00	30.44	0.93	-3.18	30.44	0.00	0.00	3.91	22.22	0.00	55.56
Kernoi	252.19	248.43	256.01	6.58	3.26	11.38	6.00	2.39	10.80	0.53	0.15	1.90	21.82	16.77	27.80
North Darfur State	251.49	246.06	256.93	8.82	3.94	13.70	7.48	2.43	12.52	1.22	0.01	2.88	23.86	15.74	31.97
Nyala South	270.02	263.49	276.20	7.70	4.30	10.55	5.92	1.88	9.02	1.89	0.67	3.55	15.14	11.63	20.04
Nyala North	260.30	252.64	271.79	5.07	0.57	16.23	3.67	-3.20	15.64	0.67	0.00	6.01	14.15	7.79	22.30
Es Salam	260.25	256.80	264.37	6.89	4.33	9.85	5.76	2.94	8.59	1.09	0.39	2.35	16.91	13.45	21.28
El Wihda	264.26	258.38	269.44	4.82	1.81	8.87	4.09	0.96	8.08	0.72	0.07	1.70	9.97	4.25	16.19
Mershing	252.40	248.47	257.66	5.78	3.06	9.63	5.14	2.21	9.08	0.50	0.12	1.42	17.91	13.11	22.77
Beliel	256.68	252.60	261.01	8.30	5.78	11.30	7.13	4.38	10.43	1.12	0.60	2.07	17.48	13.97	21.19
Nitega	255.49	246.50	263.95	6.38	1.84	19.36	5.28	-1.25	17.41	0.93	0.05	5.59	19.10	7.31	33.71

Table 38: Maternal acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 210 mm GAM %			MUAC 185 mm - 210 mm MAM %			MUAC < 185 mm SAM %			MUAC < 230 mm as in S3M-I %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sharg El Jabal (accessible parts)	236.60	228.39	245.40	2.39	0.00	16.51	2.26	-1.16	16.50	0.00	0.00	2.53	26.67	6.67	53.33
Kas	248.09	243.15	253.11	10.21	6.39	13.89	8.84	4.66	12.59	1.19	0.40	2.64	26.04	20.42	34.69
Shattaya	239.46	237.20	242.02	5.98	2.77	9.89	5.80	2.37	9.73	0.22	0.04	0.69	29.36	24.24	35.31
Buram	240.17	235.20	243.92	12.12	6.16	16.52	10.94	4.97	15.60	1.18	0.40	2.70	37.31	29.82	46.93
Gereida	257.09	251.92	262.98	11.36	7.39	15.44	8.81	4.04	13.16	2.66	1.13	4.59	23.92	17.50	30.76
El Sunta	250.11	244.77	255.24	7.24	2.94	15.45	6.47	1.22	14.74	0.64	0.05	3.70	20.92	12.06	30.65
El Radoum	247.49	242.26	252.29	6.83	4.26	10.21	6.30	3.62	9.91	0.48	0.15	1.19	23.91	18.37	30.22
Tulus	253.49	238.25	262.81	10.30	4.66	21.04	8.34	1.53	19.00	1.84	0.35	5.62	24.21	13.90	41.62
Damso	255.85	243.58	266.62	9.52	5.14	14.92	7.54	2.79	13.40	1.82	0.42	4.18	21.09	10.54	32.76
Ed Elfursan	248.46	245.33	252.76	4.91	1.90	9.52	4.51	1.78	9.31	0.23	0.03	0.94	17.54	11.58	24.40
Kubum	258.54	253.56	263.09	8.35	4.78	12.38	6.64	2.60	11.22	1.49	0.39	3.47	18.40	14.29	22.00
Kateila	251.43	247.33	256.67	2.95	0.77	7.26	2.75	0.67	7.10	0.06	0.00	0.98	13.77	9.45	20.41
Rehaid Elbirdi	257.24	251.57	263.05	6.35	2.96	10.03	5.62	2.02	9.09	0.75	0.19	1.84	18.21	13.52	24.11
Um Dafoug	250.19	246.59	253.36	4.71	2.86	7.17	4.45	2.44	6.95	0.20	0.05	0.71	18.80	14.07	24.62
South Darfur State	254.64	247.26	262.02	7.65	2.27	13.03	6.39	0.87	11.92	1.09	0.01	2.55	20.25	12.74	27.76
Abu Jabra	251.86	248.83	255.16	7.51	3.60	11.91	6.72	2.62	11.05	0.81	0.17	2.15	16.59	12.91	20.87
Abu Karinka	254.10	250.09	258.10	17.49	12.98	21.71	12.31	6.25	16.65	5.27	2.67	8.88	35.03	28.67	41.45
Bahr El Arab	250.40	244.05	256.70	8.71	4.59	12.70	7.80	3.40	11.81	0.83	0.16	2.15	20.25	10.60	30.69
Adila	259.64	253.03	267.04	15.20	9.35	29.63	11.12	-4.81	26.57	3.36	0.98	19.03	9.80	6.48	14.26
Ed Dain	267.96	261.44	274.45	12.08	7.41	16.62	8.28	3.28	13.07	3.80	1.85	6.09	16.41	11.04	21.69
Assalaya	252.43	248.40	256.37	4.59	1.88	7.70	4.15	1.64	7.49	0.27	0.06	0.94	19.38	15.10	24.85
El Firdous	243.09	239.87	246.09	5.27	3.03	10.58	5.18	2.78	10.43	0.17	0.05	1.02	23.70	18.73	28.61
Shia-ria	249.85	245.67	253.90	11.59	7.65	19.97	9.16	3.16	17.15	2.33	0.67	6.11	24.37	20.00	29.11
Yassin	247.09	242.21	252.35	5.78	2.95	10.10	5.47	2.55	9.53	0.35	0.06	1.27	20.82	15.50	27.60
East Darfur State	253.53	248.43	258.63	10.24	5.22	15.26	8.00	2.51	13.48	2.11	0.01	4.41	21.03	14.99	27.07
El Geneina	260.56	255.27	265.77	7.86	5.00	11.75	6.38	3.36	10.54	1.30	0.46	2.80	12.75	9.29	15.87
Habila	252.88	248.74	256.86	4.40	1.54	8.87	3.78	0.99	8.58	0.31	0.03	1.48	16.39	11.45	22.88
Kulbus	245.67	240.45	251.05	7.37	3.60	11.32	6.90	3.10	10.73	0.37	0.04	1.02	26.36	20.44	32.76
Beida	248.53	244.97	252.26	2.15	0.61	4.02	2.09	0.57	3.97	0.02	0.00	0.14	15.03	10.50	19.50
Foro Baranga	257.23	252.04	262.37	8.17	4.86	11.41	6.80	3.07	10.29	1.33	0.26	2.72	15.90	11.51	21.21
Kereneik	253.81	250.75	257.04	6.51	4.01	9.19	5.75	3.13	8.35	0.73	0.35	1.23	17.00	13.25	21.25
Sirba	250.39	246.84	253.92	4.02	1.23	7.00	3.83	0.99	6.73	0.18	0.01	0.69	10.81	7.01	15.31

Table 38: Maternal acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 210 mm GAM %			MUAC 185 mm - 210 mm MAM %			MUAC < 185 mm SAM %			MUAC < 230 mm as in S3M-I %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Jebel Moon	252.80	248.91	256.26	1.90	0.29	4.95	1.80	0.25	4.94	0.04	0.00	0.23	11.41	6.29	19.63
West Darfur State	253.99	249.35	258.64	5.87	2.71	9.02	5.08	1.67	8.48	0.67	0.01	1.60	15.35	10.25	20.45
Zalingi	257.79	254.35	261.61	10.48	8.31	13.34	8.29	5.60	11.27	2.31	1.26	3.53	19.01	14.35	23.26
Wadi Salih	249.12	245.52	252.95	1.23	0.48	2.87	1.22	0.48	2.86	0.01	0.00	0.09	12.19	8.67	16.24
Mukjar	253.80	249.18	258.89	4.30	1.42	9.95	3.93	0.91	9.46	0.20	0.01	1.40	16.86	11.16	24.85
Central Jebel Mara	243.99	236.82	252.17	15.92	5.91	24.79	13.03	1.62	21.36	2.61	0.25	7.31	35.00	22.54	47.26
North Jebel Mara	250.05	246.95	254.34	0.60	0.01	4.16	0.56	-0.02	4.16	0.00	0.00	0.20	10.00	3.95	17.73
Bendasi	247.73	243.68	251.77	5.54	1.54	12.50	4.98	1.04	12.03	0.27	0.01	1.95	25.68	18.12	32.84
Nertiti	249.63	246.63	252.80	3.34	1.49	5.94	3.19	1.31	5.78	0.10	0.01	0.44	12.36	8.83	17.87
Azum	254.36	250.50	258.44	3.07	0.42	6.68	2.88	0.18	6.47	0.18	0.00	0.91	17.56	12.62	22.63
Um Dukhun	249.43	246.16	252.93	6.32	3.32	8.23	5.86	2.92	8.06	0.45	0.12	0.87	19.38	14.12	24.48
Central Darfur State	250.57	245.59	255.55	6.08	1.06	11.09	5.21	0.01	10.52	0.81	0.01	2.41	19.24	11.91	26.57

Spatial distribution of maternal acute malnutrition

FIGURE 147:
Carer: Mean MUAC (mm) (raster)

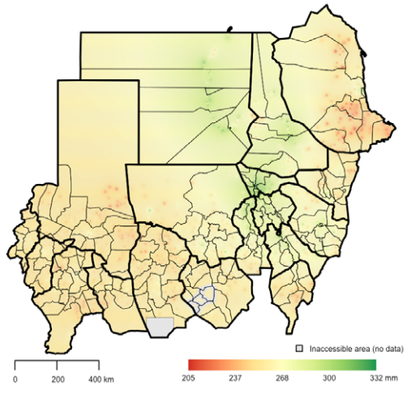


FIGURE 148:
Carer: Mean MUAC (mm)

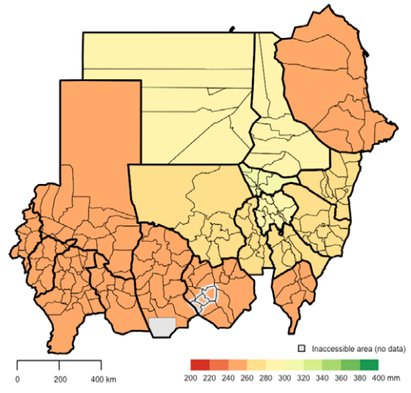


FIGURE 149:
Carer: MUAC < 210 mm (GAM) (raster)

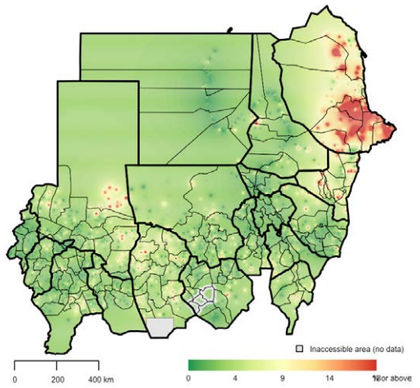


FIGURE 150:
Carer: MUAC < 210 mm (GAM)

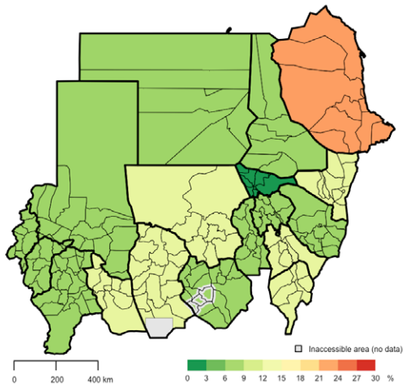


FIGURE 151:
Carer: MUAC between 185 mm and 210 mm (MAM) (raster)

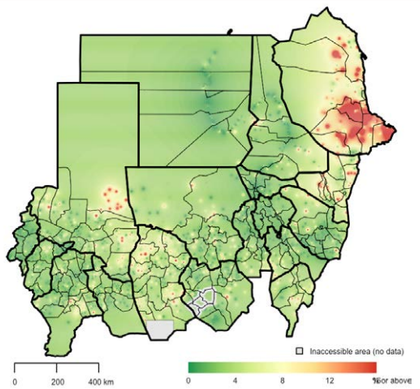


FIGURE 152:
Carer: MUAC between 185 mm and 210 mm (MAM)

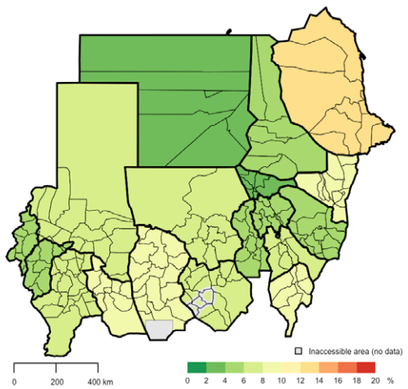


FIGURE 153:
Carer: MUAC < 185 mm (SAM) (raster)

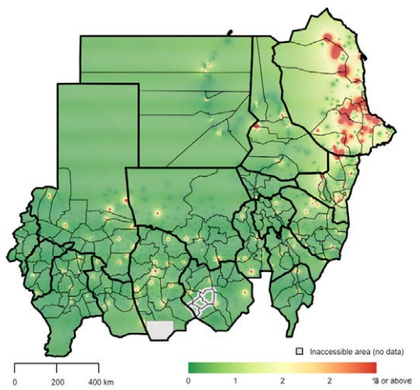


FIGURE 154:
Carer: MUAC < 185 mm (SAM)

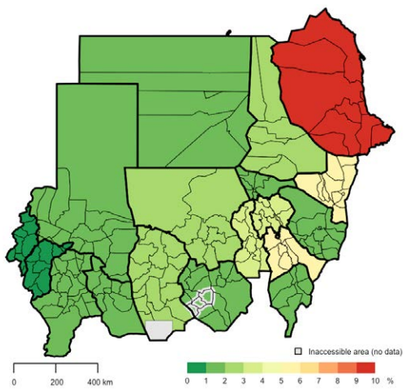


FIGURE 155:
Carer: Mid-upper-arm circumference < 230 mm (as in S3M-I) (raster)

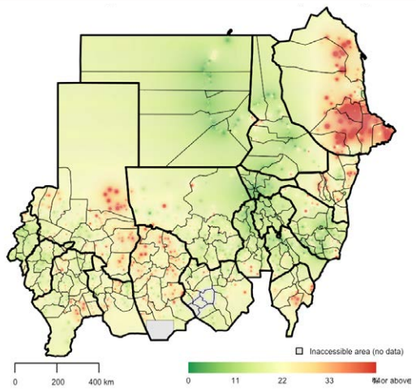
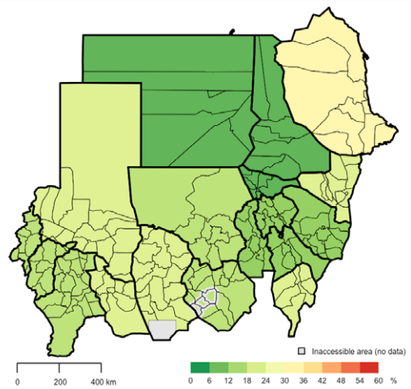


FIGURE 156:
Carer: Mid-upper-arm circumference < 230 mm (as in S3M-I)

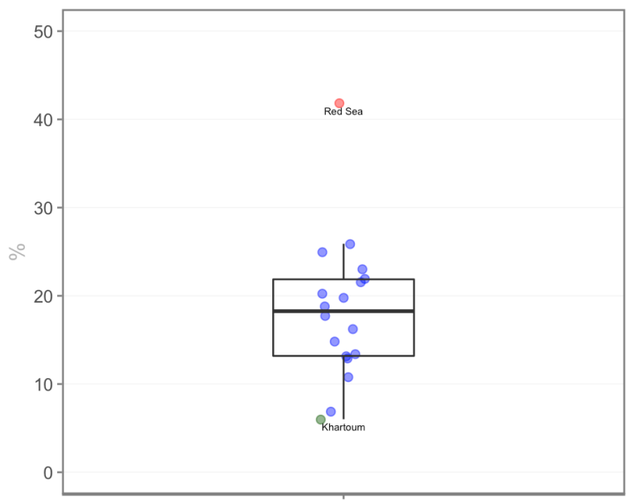


3.6.2 Prevalence of pregnant and lactating women (PLW) nutritional status: undernutrition

Pregnant and lactating women (PLW) GAM (MUAC < 230 mm) average results

Pregnant and lactating women (PLW) GAM (MUAC < 230 mm) prevalence was high at 17.4 per cent (95 per cent CI: 10.2-24.7 per cent) for the whole country. Red Sea state had the highest prevalence, significantly higher than all other state estimates. Khartoum state had the lowest prevalence *(see Figure 157)*.

FIGURE 157: Box plot of state results of PLW acute undernutrition indicators



Among localities, 81.1 had more than 10 per cent of carers with MUAC < 230 mm. PLW GAM based on MUAC < 230 mm was a major problem in almost all localities in Red Sea. Khartoum and Northern state localities have the lowest prevalence of maternal acute undernutrition *(see Figure 158).*

Table 39 and Table 40 present results per state, per locality and at the national level for estimates of pregnant and lactating women's acute undernutrition in Sudan.

FIGURE 158: Box plot of locality results of PLW acute undernutrition indicators

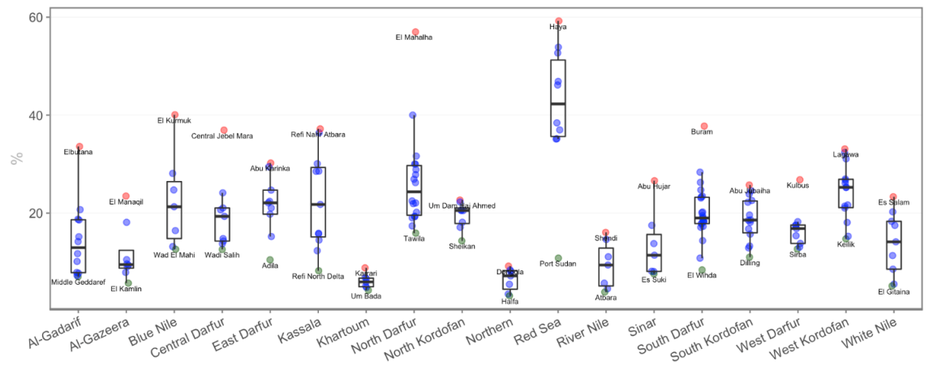


Table 39: PLW acute undernutrition by state and national

State	Mean MUAC (mm)			MUAC < 230 mm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	268.30	261.28	275.32	13.12	6.93	19.31
Al-Gazeera	279.30	268.75	289.85	14.81	6.92	22.71
Blue Nile	254.94	248.63	261.26	23.04	16.59	29.50
Central Darfur	250.58	245.35	255.80	19.72	12.16	27.28
East Darfur	253.57	246.96	260.19	21.96	14.71	29.21
Kassala	261.37	253.89	268.86	21.60	14.87	28.33
Khartoum	300.89	290.99	310.79	6.01	2.24	9.79
North Darfur	250.03	243.61	256.46	25.90	13.41	38.38
North Kordofan	261.67	256.14	267.19	17.73	12.75	22.71
Northern	289.16	280.59	297.73	6.91	2.39	11.43
Red Sea	243.66	235.72	251.59	41.80	30.28	53.33
River Nile	280.54	271.24	289.83	10.79	5.51	16.06
Sennar	274.35	266.24	282.46	13.39	7.70	19.07
South Darfur	253.87	246.25	261.49	20.30	12.24	28.37
South Kordofan	255.08	249.60	260.56	18.79	12.75	24.83

Table 39: PLW acute undernutrition by state and national

State	Mean MUAC (mm)			MUAC < 230 mm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
West Darfur	253.59	248.26	258.92	16.22	10.53	21.91
West Kordofan	252.48	246.35	258.62	24.98	17.85	32.11
White Nile	275.75	267.92	283.57	12.95	7.75	18.15
Sudan	269.46	261.36	277.57	16.98	9.82	24.14

Table 40: PLW acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 230 mm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	287.81	279.09	296.34	8.90	5.15	13.12
El Golid	285.90	279.64	292.24	5.26	2.08	9.75
Merwoe	277.00	264.64	287.74	8.54	3.57	13.93
El Daba	303.48	296.15	310.03	3.50	0.39	8.67
Halfa	289.62	283.15	296.88	6.15	2.92	10.52
Delgo	285.39	279.10	293.24	7.35	3.86	11.81
El Burgaig	292.07	284.33	300.25	7.55	4.16	12.34
Northern State	289.16	280.59	297.73	6.91	2.39	11.43
El Matama	284.89	277.21	292.14	5.94	2.87	10.06
Shendi	266.55	258.38	276.13	16.30	10.60	22.61
Abu Hamad	278.63	268.34	288.69	7.14	2.56	13.39
Barbar	281.90	270.01	294.72	15.09	8.08	24.46
El Damar	287.44	280.27	294.43	8.89	6.14	12.20
Atbara	292.17	282.62	302.18	7.14	3.20	11.47
El Buhaira	268.45	263.01	273.98	11.13	6.17	17.58
River Nile State	280.54	271.24	289.83	10.79	5.51	16.06
Khartoum	305.30	295.48	315.93	7.32	3.98	11.11
Bahri	314.55	302.71	325.19	4.57	1.72	8.20
Um Durman	296.14	288.64	304.32	6.77	3.66	10.08
Um Bada	294.39	285.64	301.71	5.49	2.30	9.29
Jebel Awlia	297.36	285.65	309.41	6.06	2.37	10.19
Sharg Elneel	301.76	292.99	311.03	5.13	1.94	9.63
Karrari	300.81	291.45	310.04	7.33	3.62	12.81
Khartoum State	300.89	290.99	310.79	6.01	2.24	9.79

Table 40: PLW acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 230 mm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Greater Medani	287.28	277.48	296.50	8.40	4.73	12.76
Ganub Elgazira	286.39	276.87	295.41	9.92	4.83	14.73
El Hassahisa	287.44	274.03	300.89	11.85	7.12	17.94
El Kamlin	291.36	278.19	304.60	5.86	2.22	11.01
Sharg El Gezira	287.85	280.84	296.02	9.85	5.77	14.88
Um Elqura	273.01	265.63	280.49	16.40	11.02	22.70
El Manaqil	259.00	247.79	271.79	32.49	16.58	48.93
El Qurashi	275.56	268.86	284.22	9.35	5.73	13.95
Al-Gazeera State	279.30	268.75	289.85	14.81	6.92	22.71
Sennar	289.52	281.81	296.96	9.09	5.99	12.89
Sharg Sennar	263.58	256.60	271.48	17.63	11.70	24.40
Sinja	287.02	278.83	296.65	8.20	4.87	12.30
Abu Hujar	260.26	252.08	269.47	25.00	17.97	31.94
El Dali	264.36	255.12	274.54	17.02	10.58	23.85
Es Suki	275.53	269.31	282.29	10.92	5.43	18.43
Ed Dinder	266.68	258.05	274.70	13.69	7.78	19.97
Sennar State	274.35	266.24	282.46	13.39	7.70	19.07
Ed Damazine	266.02	257.87	276.05	18.47	13.34	24.55
El Tadamon	259.99	251.46	267.75	16.55	10.26	22.27
El Roseiris	257.83	252.45	263.69	24.30	18.29	30.96
Baw	249.02	243.58	253.98	27.87	21.24	34.03
Geisan	251.27	245.71	256.39	14.06	9.26	20.44
El Kurmuk	235.29	231.43	240.31	40.23	32.17	47.53
Wad El Mahi	253.86	248.77	259.11	18.55	11.97	25.31
Blue Nile State	254.94	248.63	261.26	23.04	16.59	29.50
Kosti	269.05	261.38	276.65	18.85	12.89	24.51
Guli	261.47	255.78	267.83	17.72	13.45	23.06
Tendalti	268.49	261.24	276.95	14.72	8.20	22.04
Es Salam	251.81	245.87	257.80	23.82	17.37	30.54
Rabak	282.16	276.44	288.76	11.44	7.24	15.85
El Jabalain	268.94	259.89	277.78	14.36	8.38	20.94
El Diwaim	281.58	274.16	289.23	6.43	2.80	10.36
Um Rimta	297.06	285.81	306.51	8.44	3.95	13.57
El Gitaina	290.91	283.14	300.44	5.71	2.60	8.97
White Nile State	275.75	267.92	283.57	12.95	7.75	18.15
Port Sudan	285.40	276.09	294.53	12.68	6.75	19.38
Swakin	241.50	234.46	248.13	42.68	35.48	50.98

Table 40: PLW acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 230 mm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Gonob Welawlaib	238.65	233.66	245.51	33.20	26.13	40.53
Sinkat	228.76	224.40	232.98	52.32	44.79	60.87
Haya	228.04	218.34	237.82	59.31	45.16	71.21
Dordieb	232.74	225.58	239.60	53.41	44.24	60.65
Tokar	235.54	229.95	241.39	48.96	40.31	56.88
Agig	237.39	231.32	243.67	40.40	29.42	52.76
Gabaot Elma-aadin	243.47	234.15	252.15	37.32	26.23	51.20
Halaeeb (accessible parts)	236.45	228.67	247.80	43.48	15.97	58.22
Red Sea State	243.66	235.72	251.59	41.80	30.28	53.33
Kassala Town	269.82	262.80	275.89	12.02	7.38	17.84
Refi Kassla	261.07	255.89	266.42	22.20	17.34	27.17
Rural Western Kassala	243.17	237.24	248.91	36.13	29.50	43.24
New Halfa	275.65	264.87	288.85	17.07	10.26	25.44
Refi Nahr Atbara	253.62	245.62	260.37	36.91	29.64	44.77
Rural Khashm Elgirba	274.40	266.19	284.19	15.03	9.84	22.56
Rural Wad Elhilaiw	249.59	245.07	255.01	28.71	23.27	34.64
Rural Aroma	246.90	239.28	254.27	34.64	25.97	45.72
Refi North Delta	274.53	267.63	281.05	8.05	3.32	14.33
Refi Hamashkureib	261.01	254.02	268.28	15.09	10.79	20.31
Rural Telkok	251.21	244.30	256.92	28.17	20.98	36.30
Kassala State	261.37	253.89	268.86	21.60	14.87	28.33
Gedaref Town	270.54	264.18	279.49	10.84	6.70	15.41
Middle Geddaref	281.14	271.03	290.32	6.94	2.70	12.46
Elbutana	248.73	240.21	257.36	34.13	23.61	44.53
El Fashaga	272.46	266.34	278.54	7.72	3.01	12.65
El Rahad	272.43	267.10	278.93	7.29	3.22	12.01
Gala-a El Nahal	265.53	258.94	272.66	11.73	6.45	17.46
El Fao	261.84	257.13	267.20	17.43	11.04	23.50
El Qureisha	270.52	262.91	278.40	13.59	7.85	18.33
El Mafaza	259.29	253.94	266.00	15.55	8.35	22.39
Basunda	270.27	260.88	277.87	14.37	8.67	23.46
Western Galabat	284.55	274.55	293.92	8.33	3.62	13.55
Eastern Galabat	261.89	256.92	266.54	18.30	12.01	25.18
Al-Gadarif State	268.30	261.28	275.32	13.12	6.93	19.31
Sheikan	268.59	263.59	274.24	13.57	10.28	17.21

Table 40: PLW acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 230 mm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Um Rawaba	264.72	259.64	271.38	16.72	12.67	21.75
Um Dam Haj Ahmed	258.90	252.32	268.05	20.37	14.20	26.04
El Rahad	257.51	251.29	263.55	22.15	16.67	27.19
Bara	259.52	254.27	266.15	20.00	13.95	26.86
Gharb Bara	255.75	251.12	260.33	21.84	16.83	27.90
Soudari	254.47	249.63	261.63	17.66	13.20	23.65
Gebrat El Sheikh	258.20	251.29	265.25	19.37	13.69	25.59
North Kordofan State	261.67	256.14	267.19	17.73	12.75	22.71
Kadugli	263.24	258.88	267.89	17.57	13.36	22.88
Reif Shargi	252.55	248.08	256.69	20.06	14.43	28.75
Dilling	261.40	255.18	267.33	7.17	2.87	13.37
El Quoz	255.13	250.59	260.26	16.71	11.55	22.78
Habila	248.69	244.15	253.05	27.84	21.94	34.57
Abassiya	260.55	255.73	265.49	13.42	9.15	19.32
El Rashad	253.11	248.95	258.03	19.09	13.21	23.94
Abu Jubaiha	245.58	240.01	251.82	29.57	23.40	36.14
El Tadamon	258.04	252.42	263.37	16.30	9.76	24.87
Talodi	257.77	251.46	265.28	13.68	7.69	20.46
Ghadeer	256.87	250.10	264.89	23.89	17.37	31.60
El Leri	257.95	253.89	262.40	16.08	11.58	21.10
Abu Karshola	250.51	247.52	254.21	22.31	16.90	27.56
Delami	253.03	244.91	260.63	18.75	12.31	28.50
South Kordofan State	255.08	249.60	260.56	18.79	12.75	24.83
Abu Zabad	256.91	249.00	263.43	22.19	14.77	29.62
ElKhiwai	254.93	245.27	263.31	26.82	20.24	34.76
Ghubaish	249.80	244.58	255.23	30.25	22.64	37.39
El Nuhud	249.10	244.85	254.51	23.61	17.92	28.92
El Idia	254.84	249.52	262.45	21.11	15.84	27.32
Wad Benda	243.47	238.90	248.09	32.59	25.94	40.26
Lagawa	249.43	242.31	255.85	33.45	26.09	40.69
Elsunut	248.94	243.50	254.02	29.00	21.85	36.53
Keilik	259.55	254.44	263.90	14.97	10.05	21.08
Es Salam	265.71	259.46	272.51	17.96	12.68	22.72
Babanusa	255.01	249.85	259.77	21.78	17.24	26.37
Abyei	251.82	247.82	255.92	25.46	18.86	32.84
El Dibab	256.10	248.82	264.20	24.49	15.75	35.05

Table 40: PLW acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 230 mm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Meiram	264.71	257.03	273.01	14.97	8.92	23.90
West Kordofan State	252.48	246.35	258.62	24.98	17.85	32.11
El Fasher	259.28	253.84	265.05	21.08	16.78	25.11
Tawila	257.20	250.35	265.81	14.04	8.26	20.28
Melit	243.72	239.80	248.51	27.78	20.91	34.23
Um Kadada	241.71	238.56	245.24	31.27	26.37	37.05
Kebkabiya	252.46	248.31	256.59	19.05	14.17	24.77
Kutum	247.83	244.00	251.71	19.62	15.11	25.00
El Mahalha	229.65	224.41	234.63	56.06	49.01	63.49
Saraf Omra	251.98	246.72	257.85	21.92	15.64	28.12
El Serief	250.61	246.61	254.86	25.66	19.31	31.37
Dar Elsalam	243.22	238.40	250.07	31.05	25.08	37.03
Kelemando	248.35	243.72	254.00	26.15	20.05	32.31
El Tawisha	251.80	247.83	256.21	22.61	17.38	27.98
Um Baru	252.97	248.76	260.96	19.90	11.29	28.28
El Lait	259.86	250.60	273.39	17.92	11.82	24.10
ELkuma	253.70	241.46	262.17	29.85	19.55	43.17
El Tina	240.00	227.00	256.00	40.00	0.00	80.00
Kernoi	249.92	246.36	254.13	24.60	18.89	30.26
North Darfur State	250.03	243.61	256.46	25.90	13.41	38.38
Nyala South	264.64	258.54	272.31	18.14	13.33	23.45
Nyala North	260.53	253.64	272.54	10.53	4.08	17.54
Es Salam	259.81	255.32	263.87	17.38	13.22	21.90
El Wihda	263.18	256.90	269.21	9.39	4.57	14.68
Mershing	251.92	247.66	257.30	18.62	13.47	23.70
Beliel	256.21	252.60	260.44	17.79	14.26	21.84
Nitega	255.27	246.96	262.66	19.61	9.20	33.69
Sharg El Jabal (accessible parts)	235.23	229.15	241.93	23.08	0.00	46.54
Kas	247.56	242.00	253.37	26.43	19.61	36.01
Shattaya	239.83	237.13	242.08	28.78	23.03	33.73
Buram	240.22	235.00	244.77	37.79	30.09	47.17
Gereida	255.11	248.80	261.16	23.24	15.48	31.31
El Sunta	249.98	245.11	254.94	20.71	11.97	29.03
El Radoum	247.03	242.48	251.89	22.46	17.16	28.92
Tulus	252.86	237.88	262.95	25.17	14.92	41.01
Damso	253.97	242.99	265.59	21.70	11.21	34.80

Table 40: PLW acute undernutrition by locality and by state

Location	Mean MUAC (mm)			MUAC < 230 mm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ed Elfursan	248.61	244.67	252.45	17.25	11.04	23.66
Kubum	258.47	253.22	263.65	18.23	14.06	22.27
Kateila	251.14	247.10	257.17	14.20	9.29	20.08
Rehaid Elbirdi	255.65	250.50	262.37	18.97	13.65	23.75
Um Dafoug	249.17	245.62	253.77	19.00	12.67	25.57
South Darfur State	253.87	246.25	261.49	20.30	12.24	28.37
Abu Jabra	258.45	250.34	270.44	15.86	11.77	20.69
Abu Karinka	254.01	249.34	259.22	34.82	28.17	41.32
Bahr El Arab	248.32	241.00	259.02	22.16	12.38	33.69
Adila	261.95	254.83	267.90	10.20	6.49	15.86
Ed Dain	264.39	257.94	272.66	18.75	13.14	24.41
Assalaya	252.89	248.60	257.11	19.42	15.18	25.23
El Firdous	242.85	239.42	246.75	27.27	21.51	33.46
Shia-ria	251.14	246.56	255.15	24.15	19.21	30.01
Yassin	247.28	241.25	253.67	21.68	15.80	29.38
East Darfur State	253.57	246.96	260.19	21.96	14.71	29.21
El Geneina	260.49	254.89	268.06	13.28	9.47	16.75
Habila	251.17	247.18	255.45	17.60	10.74	26.27
Kulbus	245.43	239.59	253.60	26.14	18.51	34.43
Beida	247.96	244.08	251.45	17.07	12.48	23.16
Foro Baranga	256.06	249.55	262.50	18.45	12.43	25.27
Kereneik	252.83	250.11	255.96	16.89	12.30	21.73
Sirba	250.55	246.87	254.55	11.02	6.64	16.75
Jebel Moon	251.73	247.78	255.72	12.63	6.17	21.63
West Darfur State	253.59	248.26	258.92	16.22	10.53	21.91
Zalingi	257.31	253.27	261.80	19.01	14.60	23.25
Wadi Salih	249.38	245.36	253.39	13.18	8.81	18.47
Mukjar	253.23	248.74	258.02	14.75	9.35	20.49
Central Jebel Mara	244.38	235.97	252.01	36.67	23.15	50.00
North Jebel Mara	249.84	245.22	254.16	12.84	6.06	21.23
Bendasi	248.11	242.88	252.94	25.25	17.11	33.52
Nertiti	248.70	245.32	252.78	13.19	8.52	18.45
Azum	254.45	248.68	259.81	18.56	12.61	25.22
Um Dukhun	250.04	246.88	253.98	20.76	15.04	26.78
Central Darfur State	250.58	245.35	255.80	19.72	12.16	27.28

Spatial distribution of PLW acute undernutrition

The spatial pattern of PLW acute undernutrition prevalence follows the same pattern as maternal acute undernutrition described earlier.

FIGURE 159:
PLW carers / other PLW: MUAC (raster)

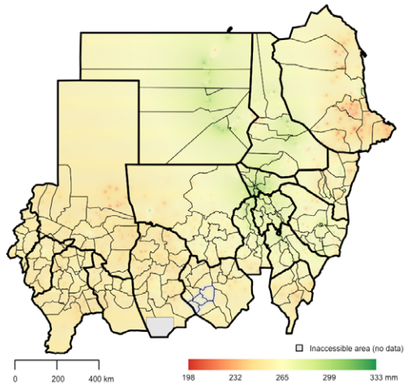


FIGURE 160:
PLW carers / other PLW: MUAC

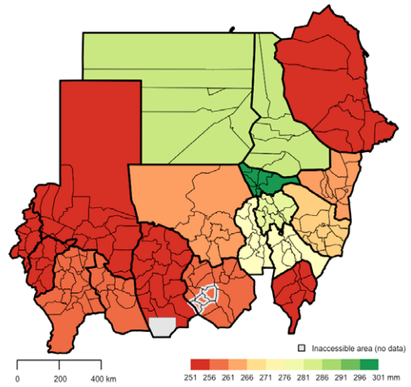


FIGURE 161:
PLW carers / other PLW: MUAC < 230 mm (raster)

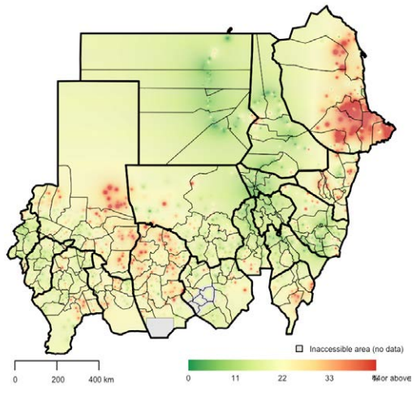
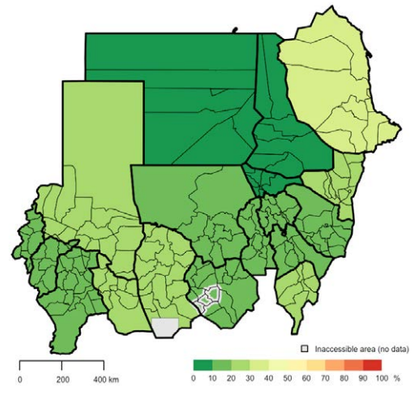


FIGURE 162:
PLW carers / other PLW: MUAC < 230 mm



3.7 Women's Diet

The diet for women (carers of under-five children, most of whom were women of reproductive age) was assessed through an individual assessment of dietary diversity using a qualitative approach to food consumption that reflects household access to a wide variety of foods, and which is also a proxy for the nutrient adequacy of the diet for individuals. For the *Sudan S3M II*, two 24-hour recall dietary diversity indicators for women were used: the women's dietary diversity score or WDDS[43]; and the minimum dietary diversity for women or MDD-W[44] (FAO and FHI 360 2016). Women's diets were also assessed by estimating consumption of specific micronutrients based on food consumed in the 24 hours prior to the survey. Following are the results of these women's diet indicators.

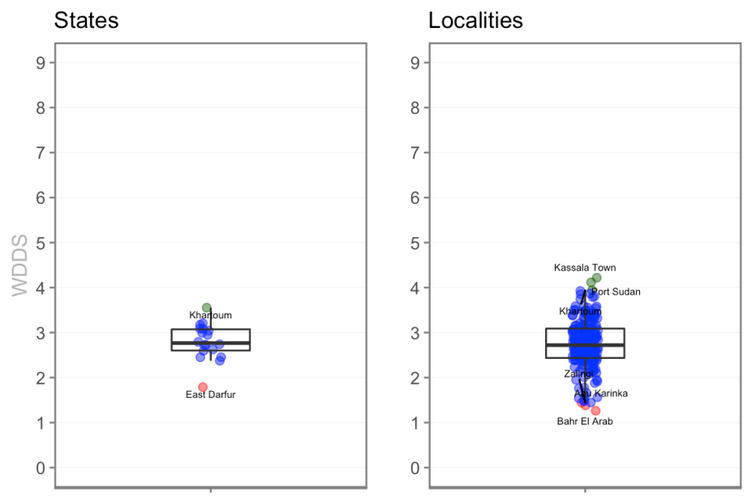
3.7.1 Women's dietary diversity

Women's dietary diversity score (WDDS) average results

The WDDS assesses the number of food groups (out of nine total food groups) consumed by a woman of reproductive age in the past 24 hours. The MDD-W, on the other hand, is a dichotomous indicator of whether a woman of reproductive age has consumed at least 5 out of 10 defined food groups the previous day or night. Both indicators are said to be proxies for the micronutrient adequacy of women's diets. However, the MDD-W has now superseded WDDS as the indicator of choice for assessing women's dietary diversity.

In the S3M II survey, the mean WDDS of women aged 15-49 years in Sudan was low at 2.95 (95 per cent CI: 2.7-3.2) food groups out of 9. Of the states, Khartoum state had the highest mean WDDS at 3.6 (95 per cent CI: 3.3-3.8), while East Darfur state had the lowest mean WDDS at 1.8 (95 per cent CI: 1.6-2.0) *(see Figure 163)*. Across localities, there was very little inter-locality variation, with all localities at a very low mean WDDS. Around 31.4 per cent of localities had a mean WDDS of fewer than three food groups *(see Figure 163)*.

FIGURE 163: Box plot of state and locality results for WDDS



[43] Kennedy, Gina, Terri Ballard and MarieClaude Dop, *Guidelines for Measuring Household and Individual Dietary Diversity*, Food and Agriculture Organization of the United Nations, Rome, 2011.

[44] Food and Nutrition Technical Assistance, *Minimum Dietary Diversity for Women- A Guide to Measurement*, Food and Agriculture Organization of the United Nations and USAID's Food and Nutrition Technical Assistance III Project (FANTA), managed by FHI 360, 2016, <www.fao.org/3/a-i5486e.pdf>

Women's minimum dietary diversity average results

The proportion of women who reached minimum dietary diversity under the MDD-W score was low at 9.9 per cent (95 per cent CI: 4.4-15.3 per cent) for all of Sudan. There was very little inter-state variance: 94.4 per cent of states had fewer than 20 per cent of women who achieved minimum dietary diversity *(see Figure 164)*. Khartoum state was the only state in which more than 20 per cent of women reached minimum dietary diversity, with 22.4 per cent (95 per cent CI: 13.9-30.8 per cent) at or above the minimum, still a very low result. East Darfur state had the lowest proportion of women carers achieving minimum dietary diversity at 0.8 per cent (95 per cent CI: 0.01-2.0 per cent). At the locality level, the same trend persisted: in 94.6 per cent of localities fewer than 20 per cent of women reached minimum dietary diversity. No carers at all achieved minimum dietary diversity in 13 per cent of localities *(see Figure 164)*.

Table 41 and Table 42 present locality, state and national level results for WDDS and MDD-W.

FIGURE 164: Box plot of state and locality results for MDD-W

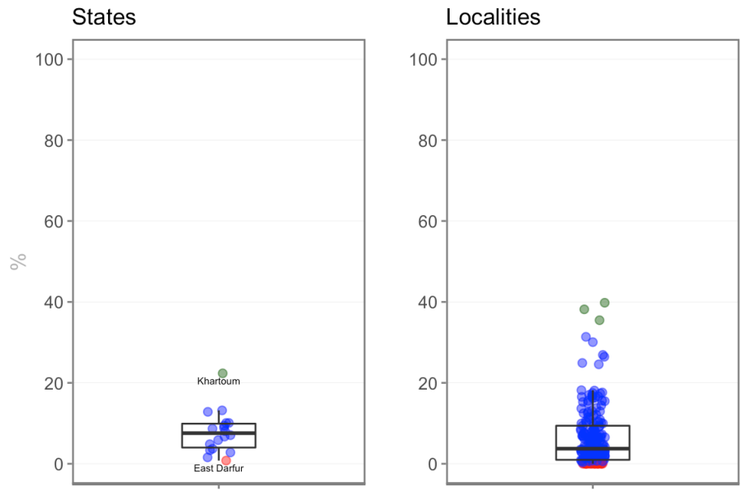


TABLE 41: Women's dietary diversity by state and national

State	Women's Dietary Diversity Score %			Minimum Dietary Diversity – Women %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	2.72	2.51	2.94	3.73	0.67	6.78
Al-Gazeera	3.21	2.97	3.45	10.09	4.85	15.34
Blue Nile	2.79	2.57	3.02	10.07	3.96	16.18
Central Darfur	2.45	2.27	2.64	1.59	0.01	3.82
East Darfur	1.79	1.60	1.98	0.78	0.01	2.02
Kassala	3.09	2.85	3.32	12.83	7.36	18.31
Khartoum	3.55	3.29	3.82	22.35	13.90	30.79

TABLE 41: Women's dietary diversity by state and national

State	Women's Dietary Diversity Score %			Minimum Dietary Diversity – Women %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
North Darfur	2.37	2.11	2.64	3.35	0.12	6.58
North Kordofan	3.04	2.81	3.27	8.87	3.96	13.77
Northern	2.73	2.40	3.06	9.43	3.21	15.65
Red Sea	2.45	2.23	2.68	6.72	1.92	11.51
River Nile	3.00	2.79	3.20	8.67	4.93	12.40
Sennar	3.18	2.94	3.41	13.20	7.94	18.46
South Darfur	2.95	2.64	3.26	8.06	2.15	13.97
South Kordofan	2.60	2.37	2.82	2.80	0.01	6.18
West Darfur	2.62	2.39	2.85	5.85	2.28	9.43
West Kordofan	2.74	2.50	2.98	4.84	0.76	8.91
White Nile	3.08	2.91	3.26	7.07	2.84	11.30
Sudan	2.95	2.70	3.19	9.87	4.41	15.33

TABLE 42: Women's dietary diversity by locality and by state

Location	Women's Dietary Diversity Score %			Minimum Dietary Diversity – Women %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	3.00	2.69	3.27	12.50	8.33	17.23
El Golid	2.44	1.91	3.14	13.39	4.68	24.80
Merwoe	2.77	2.48	3.02	5.16	2.42	8.37
El Daba	2.25	1.92	2.63	5.12	0.94	12.44
Halfa	2.84	2.63	3.13	6.67	1.91	13.28
Delgo	3.55	3.35	3.73	13.28	8.18	20.42
El Burgaig	2.91	2.61	3.20	13.21	6.39	20.81
Northern State	2.73	2.40	3.06	9.43	3.21	15.65
El Matama	2.87	2.68	3.08	4.60	2.13	8.36
Shendi	2.76	2.62	2.90	1.85	0.36	3.63
Abu Hamad	2.35	2.18	2.53	2.32	0.23	4.99
Barbar	2.46	2.14	2.77	1.84	0.00	4.73
El Damar	3.50	3.29	3.71	17.97	13.07	22.93
Atbara	3.76	3.53	4.00	23.08	15.87	29.49
El Buhaira	2.70	2.60	2.82	0.41	0.00	1.23
River Nile State	3.00	2.79	3.20	8.67	4.93	12.40

Location	Women's Dietary Diversity Score %			Minimum Dietary Diversity – Women %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Khartoum	3.90	3.65	4.12	30.51	23.57	37.33
Bahri	3.41	3.11	3.71	17.86	10.05	29.81
Um Durman	3.50	3.19	3.78	17.57	11.67	24.30
Um Bada	3.71	3.48	3.92	29.87	19.76	40.77
Jebel Awlia	3.24	3.05	3.44	13.48	6.55	21.80
Sharg Elneel	3.39	3.18	3.62	15.18	8.55	23.26
Karrari	3.82	3.51	4.09	29.49	21.51	38.03
Khartoum State	3.55	3.29	3.82	22.35	13.90	30.79
Greater Medani	3.33	3.07	3.58	15.37	7.93	23.60
Ganub Elgazira	3.24	3.08	3.40	9.73	6.17	14.76
El Hassahisa	3.48	3.29	3.68	13.89	8.32	19.35
El Kamlin	3.47	3.26	3.69	11.93	6.98	18.51
Sharg El Gezira	3.35	3.12	3.54	13.00	8.82	18.02
Um Elqura	3.21	3.00	3.42	9.43	5.53	14.08
El Manaqil	2.82	2.55	3.06	3.87	0.99	8.42
El Qurashi	3.14	2.79	3.45	8.78	4.08	15.53
Al-Gazeera State	3.21	2.97	3.45	10.09	4.85	15.34
Sennar	3.77	3.61	3.95	26.53	20.72	33.06
Sharg Sennar	2.12	1.91	2.36	0.53	0.00	1.96
Sinja	3.31	3.09	3.53	16.88	11.54	21.99
Abu Hujar	3.02	2.82	3.22	7.41	2.63	13.19
El Dali	3.35	3.22	3.50	6.58	3.06	10.42
Es Suki	3.49	3.21	3.77	17.30	10.23	23.79
Ed Dinder	3.08	2.83	3.34	6.54	2.83	11.32
Sennar State	3.18	2.94	3.41	13.20	7.94	18.46
Ed Damazine	3.06	2.78	3.45	14.44	6.68	22.24
El Tadamon	3.05	2.91	3.20	17.46	11.92	22.91
El Roseiris	3.06	2.80	3.33	15.10	7.82	22.93
Baw	2.80	2.64	2.95	5.88	2.67	9.41
Geisan	2.42	2.31	2.58	4.26	1.59	7.14
El Kurmuk	1.92	1.79	2.07	0.00	0.00	0.00
Wad El Mahi	2.75	2.57	2.93	7.72	4.10	12.45
Blue Nile State	2.79	2.57	3.02	10.07	3.96	16.18
Kosti	2.94	2.73	3.16	8.55	4.01	14.11
Guli	2.87	2.71	3.03	2.29	0.57	5.14
Tendalti	2.45	2.34	2.59	1.51	0.21	3.55
Es Salam	2.93	2.80	3.05	1.52	0.00	4.10

TABLE 42: Women's dietary diversity by locality and by state

Location	Women's Dietary Diversity Score %			Minimum Dietary Diversity – Women %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rabak	2.98	2.73	3.22	11.99	6.66	17.72
El Jabalain	2.65	2.53	2.75	0.95	0.00	2.51
El Diwaim	3.46	3.31	3.58	5.12	2.15	9.75
Um Rimta	3.36	3.19	3.53	8.05	3.47	13.41
El Gitaina	3.72	3.59	3.84	14.75	10.38	20.13
White Nile State	3.08	2.91	3.26	7.07	2.84	11.30
Port Sudan	3.81	3.49	4.11	29.42	20.50	38.31
Swakin	2.17	1.98	2.36	1.06	0.00	2.84
El Gonob Welawlaib	2.63	2.52	2.72	2.52	1.04	4.51
Sinkat	1.94	1.74	2.23	0.00	0.00	0.00
Haya	1.61	1.46	1.75	0.00	0.00	0.00
Dordieb	2.25	2.08	2.40	0.00	0.00	0.00
Tokar	2.65	2.37	2.95	2.86	0.00	7.16
Agig	1.54	1.38	1.71	0.00	0.00	1.06
Gabaot Elma-aadin	3.13	2.94	3.32	4.96	1.50	9.46
Halaeeb (accessible parts)	2.63	2.29	2.82	1.92	0.00	6.39
Red Sea State	2.45	2.23	2.68	6.72	1.92	11.51
Kassala Town	4.20	3.97	4.45	39.64	31.54	47.29
Refi Kassla	2.70	2.42	2.97	7.98	4.66	11.82
Rural Western Kassala	3.14	3.00	3.29	8.50	5.18	12.02
New Halfa	3.23	2.91	3.53	12.54	5.86	18.82
Refi Nahr Atbara	3.56	3.20	3.89	23.79	15.55	31.77
Rural Khashm Elgirba	3.60	3.38	3.78	12.29	5.25	20.87
Rural Wad Elhilaiw	2.41	2.25	2.57	0.52	0.00	2.08
Rural Aroma	2.45	2.31	2.62	0.63	0.00	2.23
Refi North Delta	1.97	1.82	2.14	0.25	0.00	1.69
Refi Hamashkureib	2.94	2.76	3.15	4.99	2.18	8.68
Rural Telkok	2.42	2.27	2.59	0.87	0.00	2.38
Kassala State	3.09	2.85	3.32	12.83	7.36	18.31
Gedaref Town	3.00	2.75	3.26	8.85	5.32	13.11
Middle Geddaref	2.88	2.63	3.12	5.73	2.66	9.28
Elbutana	3.19	2.99	3.37	10.14	5.88	14.26
El Fashaga	2.41	2.23	2.59	1.54	0.20	3.39
El Rahad	2.58	2.37	2.79	0.82	0.00	2.43
Gala-a El Nahal	3.17	2.97	3.37	8.35	3.08	13.96
El Fao	2.50	2.38	2.61	0.53	0.00	1.78

TABLE 42: Women's dietary diversity by locality and by state

Location	Women's Dietary Diversity Score %			Minimum Dietary Diversity – Women %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Qureisha	2.67	2.49	2.93	4.38	1.15	9.58
El Mafaza	2.68	2.57	2.80	0.00	0.00	1.34
Basunda	2.53	2.34	2.81	2.43	0.47	6.12
Western Galabat	2.82	2.52	3.13	4.63	1.01	9.04
Eastern Galabat	2.61	2.48	2.79	1.60	0.35	3.86
Al-Gadarif State	2.72	2.51	2.94	3.73	0.67	6.78
Sheikan	3.17	2.89	3.44	12.84	8.11	19.44
Um Rawaba	2.98	2.78	3.23	9.91	6.06	14.97
Um Dam Haj Ahmed	3.03	2.72	3.28	10.18	4.20	18.29
El Rahad	2.88	2.70	3.04	2.42	0.73	5.25
Bara	3.05	2.84	3.33	6.71	2.75	13.01
Gharb Bara	3.02	2.76	3.28	5.67	2.02	11.76
Soudari	2.79	2.62	2.97	3.57	1.23	6.79
Gebrat El Sheikh	3.25	3.01	3.49	11.85	7.91	17.35
North Kordofan State	3.04	2.81	3.27	8.87	3.96	13.77
Kadugli	2.39	2.24	2.57	2.10	0.47	4.22
Reif Shargi	2.34	2.14	2.53	2.04	0.62	4.52
Dilling	2.70	2.50	2.89	1.90	0.00	4.21
El Quoz	2.57	2.36	2.83	6.17	3.08	10.14
Habila	2.31	2.07	2.61	2.33	0.00	5.49
Abassiya	2.59	2.39	2.77	2.16	0.78	4.10
El Rashad	2.66	2.36	2.92	7.25	3.51	12.25
Abu Jubaiha	2.67	2.50	2.93	0.00	0.00	5.27
El Tadamon	2.70	2.51	2.91	2.50	0.76	7.35
Talodi	2.80	2.49	3.09	6.99	0.67	13.89
Ghadeer	2.53	2.37	2.83	2.01	0.00	7.84
El Leri	2.50	2.40	2.64	0.64	0.00	1.89
Abu Karshola	2.60	2.38	2.92	3.31	0.21	8.92
Delami	2.48	2.28	2.68	3.72	0.00	10.30
South Kordofan State	2.60	2.37	2.82	2.80	0.01	6.18
Abu Zabad	2.75	2.51	2.99	5.13	1.57	10.50
ElKhiwai	3.09	2.84	3.29	6.89	3.93	10.83
Ghubaish	2.27	2.11	2.45	0.75	0.00	2.26
El Nuhud	2.37	2.21	2.52	1.22	0.39	2.81
El Idia	2.94	2.55	3.32	8.97	2.49	16.54
Wad Benda	2.75	2.58	2.91	6.09	3.33	9.19
Lagawa	3.17	3.02	3.29	6.82	3.86	10.03

TABLE 42: Women's dietary diversity by locality and by state

Location	Women's Dietary Diversity Score %			Minimum Dietary Diversity – Women %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Elsunut	2.89	2.65	3.11	6.16	2.59	10.19
Keilik	3.30	3.17	3.40	8.98	5.79	12.50
Es Salam	2.76	2.64	2.90	3.96	2.32	5.93
Babanusa	2.98	2.77	3.18	1.92	0.66	3.86
Abyei	2.91	2.65	3.22	11.33	4.35	18.32
El Dibab	2.88	2.68	3.09	2.06	0.00	5.21
El Meiram	2.84	2.50	3.30	4.12	0.00	12.75
West Kordofan State	2.74	2.50	2.98	4.84	0.76	8.91
El Fasher	2.32	2.13	2.53	3.33	1.31	6.61
Tawila	2.71	2.50	2.94	2.86	0.86	5.43
Melit	2.41	2.21	2.61	2.53	0.40	5.80
Um Kadada	2.12	1.93	2.32	1.73	0.53	3.41
Kebkabiya	2.95	2.82	3.09	3.28	1.39	5.59
Kutum	2.49	2.32	2.67	2.88	0.76	5.34
El Mahalha	2.20	2.03	2.36	0.50	0.00	1.69
Saraf Omra	2.37	1.78	3.01	7.34	2.53	13.06
El Serief	1.45	1.36	1.54	0.00	0.00	0.00
Dar Elsalam	2.36	2.09	2.62	0.47	0.00	1.65
Kelemando	2.72	2.46	2.95	3.85	1.53	7.08
El Tawisha	2.18	2.08	2.27	0.00	0.00	0.00
Um Baru	3.44	2.96	3.69	19.25	10.51	26.94
El Lait	2.09	1.95	2.25	1.56	0.00	5.12
ELkuma	2.28	2.10	2.46	1.04	0.00	3.98
El Tina	1.78	1.33	2.22	0.00	0.00	0.00
Kernoi	2.56	2.40	2.73	5.29	1.05	10.92
North Darfur State	2.37	2.11	2.64	3.35	0.12	6.58
Nyala South	2.36	2.20	2.53	4.96	2.65	7.97
Nyala North	2.68	1.74	3.25	9.73	2.93	16.80
Es Salam	2.74	2.63	2.84	1.75	0.34	3.26
El Wihda	2.12	1.88	2.31	1.49	0.00	3.59
Mershing	2.98	2.79	3.16	6.01	2.37	9.64
Beliel	2.56	2.37	2.74	6.90	4.13	10.34
Nitega	2.63	2.42	2.84	2.26	0.50	5.02
Sharg El Jabal (accessible parts)	1.67	1.33	2.00	0.00	0.00	0.00
Kas	3.23	3.04	3.41	15.52	9.33	21.72
Shattaya	3.91	3.69	4.13	35.18	25.33	44.46
Buram	3.50	3.37	3.63	7.65	3.58	12.90

TABLE 42: Women's dietary diversity by locality and by state

Location	Women's Dietary Diversity Score %			Minimum Dietary Diversity – Women %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Gereida	3.55	3.27	3.80	14.65	8.11	20.56
El Sunta	3.79	3.63	3.95	18.18	11.08	26.07
El Radoum	3.94	3.71	4.18	26.46	17.52	35.04
Tulus	2.96	2.78	3.42	5.56	1.63	12.52
Damso	2.92	2.58	3.67	8.22	0.00	30.64
Ed Elfursan	2.92	2.72	3.11	7.23	2.15	13.73
Kubum	2.56	2.46	2.64	0.00	0.00	0.40
Kateila	2.48	2.19	2.75	4.51	1.55	8.55
Rehaid Elbirdi	3.08	2.95	3.19	0.50	0.00	1.49
Um Dafoug	3.06	2.95	3.18	0.00	0.00	0.00
South Darfur State	2.95	2.64	3.26	8.06	2.15	13.97
Abu Jabra	1.91	1.70	2.12	1.57	0.21	3.74
Abu Karinka	1.59	1.45	1.73	0.65	0.00	1.99
Bahr El Arab	1.27	1.20	1.33	0.00	0.00	0.00
Adila	1.49	1.38	1.61	0.00	0.00	0.00
Ed Dain	2.72	2.45	2.96	3.93	1.75	7.03
Assalaya	1.53	1.29	1.80	0.00	0.00	0.00
El Firdous	2.47	2.32	2.63	0.89	0.00	2.71
Shia-ria	2.32	2.07	2.51	0.00	0.00	0.00
Yassin	1.51	1.32	1.73	0.67	0.00	1.87
East Darfur State	1.79	1.60	1.98	0.78	0.01	2.02
El Geneina	3.13	2.88	3.42	11.90	7.14	16.98
Habila	1.94	1.80	2.10	0.00	0.00	0.00
Kulbus	2.88	2.51	3.21	8.68	3.77	13.98
Beida	2.75	2.66	2.85	0.00	0.00	0.34
Foro Baranga	2.49	2.26	2.70	8.36	4.68	12.91
Kereneik	2.42	2.25	2.63	3.71	1.67	6.46
Sirba	2.16	1.97	2.41	0.57	0.00	2.00
Jebel Moon	2.15	2.01	2.30	0.00	0.00	0.00
West Darfur State	2.62	2.39	2.85	5.85	2.28	9.43
Zalingi	1.79	1.64	1.95	0.00	0.00	0.50
Wadi Salih	2.74	2.54	2.88	3.12	0.46	6.67
Mukjar	2.58	2.41	2.74	0.22	0.00	1.16
Central Jebel Mara	2.61	2.36	2.78	0.00	0.00	0.00
North Jebel Mara	2.07	1.96	2.19	0.00	0.00	0.00
Bendasi	2.64	2.42	2.85	3.96	0.99	7.24
Nertiti	2.45	2.30	2.61	1.18	0.00	3.81

TABLE 42: Women's dietary diversity by locality and by state

Location	Women's Dietary Diversity Score %			Minimum Dietary Diversity – Women %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Azum	3.22	2.95	3.46	8.71	4.75	13.89
Um Dukhun	2.21	2.11	2.33	0.00	0.00	0.00
Central Darfur State	2.45	2.27	2.64	1.59	0.01	3.82

Spatial distribution of WDDS and MDD-W

There is an even spatial spread of low WDDS and MDD-W across Sudan *(see Figure 165 and Figure 167).*

FIGURE 165: WDDS (raster)

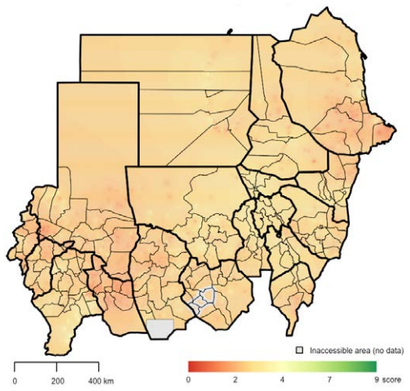


FIGURE 166: WDDS

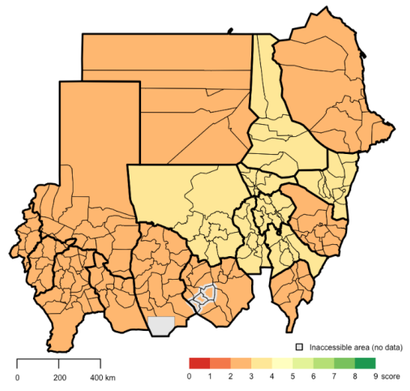


FIGURE 167: MDD-W (raster)

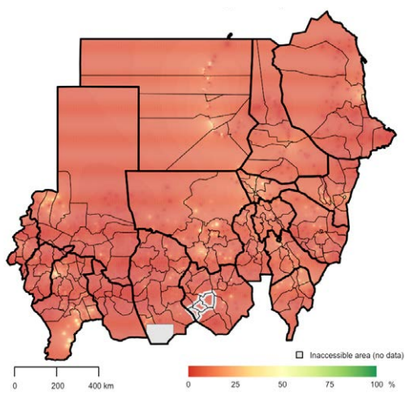
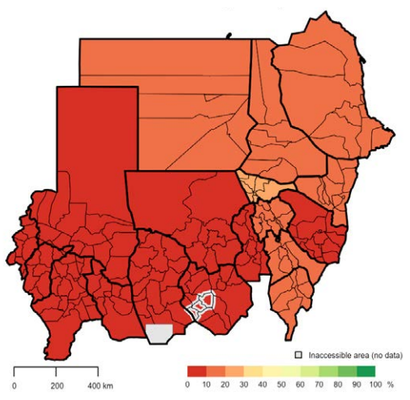


FIGURE 168: MDD-W



3.7.2 Women's consumption of protein-rich foods

Women's consumption of protein average results

Protein consumption across Sudan was high among carers interviewed, with 82.8 per cent (95 per cent CI: 75.6-90.1 per cent) consuming protein from any source. A majority of women who consumed protein-rich foods got that protein from animal sources instead of plant sources. Across states, 83.3 per cent had more than 70 per cent of women who said they consumed protein-rich foods, the majority of which was from animal sources *(see Figure 169).* Across localities, there was a little bit more inter-locality variance, with only 75.7 per cent having more than 70 per cent of carers who consumed protein-rich foods, a majority of which was from animal sources *(see Figure 169).*

FIGURE 169: Box plot of state and locality results for carers consumption of protein-rich foods

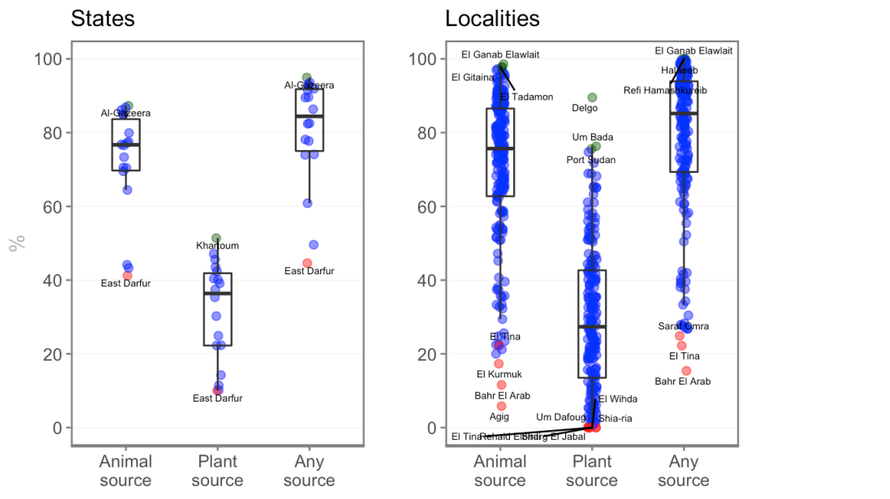


TABLE 43: Maternal consumption of protein-rich foods by state and national

State	Protein-Rich Animal Sources %			Protein-Rich Plant Sources %			Protein-Rich Any Source %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	70.42	58.51	82.33	22.24	14.32	30.15	77.71	67.32	88.10
Al-Gazeera	87.28	81.02	93.55	45.59	36.34	54.85	94.95	90.56	99.33
Blue Nile	76.82	68.09	85.55	40.43	30.04	50.83	91.90	85.52	98.27
Central Darfur	77.19	68.52	85.86	10.18	3.40	16.96	82.39	74.51	90.27
East Darfur	41.21	31.64	50.78	10.03	5.15	14.90	44.61	34.90	54.33
Kassala	86.84	80.65	93.03	35.31	27.32	43.31	92.71	88.34	97.07
Khartoum	84.91	78.50	91.32	51.42	42.40	60.44	93.07	88.77	97.37
North Darfur	44.19	33.53	54.85	11.46	6.41	16.51	49.62	38.98	60.25

TABLE 43: Maternal consumption of protein-rich foods by state and national

State	Protein-Rich Animal Sources %			Protein-Rich Plant Sources %			Protein-Rich Any Source %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
North Kordofan	76.55	69.71	83.39	43.55	35.14	51.95	89.47	84.23	94.70
Northern	43.31	29.81	56.81	42.35	28.32	56.38	60.85	46.89	74.82
Red Sea	64.47	55.98	72.96	40.11	29.89	50.33	73.98	66.29	81.66
River Nile	77.48	70.75	84.21	37.44	29.26	45.62	86.30	80.23	92.36
Sennar	85.04	77.76	92.31	39.11	31.50	46.72	91.45	85.25	97.66
South Darfur	73.32	62.59	84.05	24.94	15.76	34.12	78.14	68.18	88.10
South Kordofan	69.48	61.16	77.80	47.15	37.44	56.86	89.61	83.39	95.83
West Darfur	79.90	72.75	87.04	14.25	8.35	20.14	82.52	75.61	89.42
West Kordofan	70.53	61.66	79.40	22.32	14.38	30.25	74.11	65.51	82.72
White Nile	86.16	81.21	91.10	30.23	23.04	37.42	93.53	89.86	97.20
Sudan	74.94	66.68	83.21	34.70	26.19	43.20	82.82	75.57	90.07

TABLE 44: Maternal consumption of protein-rich foods by locality and by state

Location	Protein-Rich Animal Sources %			Protein-Rich Plant Sources %			Protein-Rich Any Source %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	53.70	43.60	62.58	35.01	21.69	50.45	61.06	50.27	71.49
El Golid	33.95	14.46	55.61	28.78	9.87	49.97	37.55	14.94	57.57
Merwoe	17.82	6.90	32.20	64.35	55.45	73.39	70.13	60.52	79.78
El Daba	34.57	19.24	50.46	29.14	16.45	43.55	41.59	24.29	57.34
Halfa	59.02	52.56	65.24	28.67	11.80	45.57	69.53	59.75	78.25
Delgo	68.50	61.28	74.10	92.81	87.29	96.96	98.33	96.71	99.61
El Burgaig	75.78	66.23	84.55	33.76	23.25	46.17	81.06	72.19	89.60
Northern State	43.31	29.81	56.81	42.35	28.32	56.38	60.85	46.89	74.82
El Matama	85.28	80.80	89.96	25.00	16.69	35.99	89.41	83.99	94.30
Shendi	74.45	66.49	81.94	22.56	16.04	29.94	82.92	76.83	88.35
Abu Hamad	68.63	63.16	73.78	15.57	6.44	26.89	76.47	69.81	83.26
Barbar	58.06	46.96	67.75	33.86	24.11	42.12	74.72	65.44	84.86
El Damar	85.66	79.97	89.57	63.56	56.09	69.46	93.83	90.20	96.63
Atbara	90.47	83.50	94.95	49.43	40.35	59.46	96.41	90.58	98.67
El Buhaira	63.31	57.74	69.13	42.49	35.31	49.73	82.03	76.75	86.25
River Nile State	77.48	70.75	84.21	37.44	29.26	45.62	86.30	80.23	92.36
Khartoum	90.12	83.71	94.96	47.35	39.36	56.05	96.94	93.49	98.81

Location	Protein-Rich Animal Sources %			Protein-Rich Plant Sources %			Protein-Rich Any Source %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Bahri	74.27	67.26	83.04	53.96	46.74	61.33	85.37	79.18	91.04
Um Durman	80.26	73.38	85.80	54.31	45.80	63.54	94.35	90.10	97.59
Um Bada	91.42	85.56	94.91	70.21	56.29	82.01	99.04	94.54	100.00
Jebel Awlia	81.03	74.72	86.86	25.96	18.66	33.42	85.10	78.75	90.67
Sharg Elneel	85.04	78.77	91.58	45.45	35.58	54.77	95.30	92.47	97.53
Karrari	88.61	81.85	93.69	66.21	56.42	73.89	95.15	90.15	98.08
Khartoum State	84.91	78.50	91.32	51.42	42.40	60.44	93.07	88.77	97.37
Greater Medani	78.33	73.12	83.22	59.97	52.62	67.53	91.12	86.90	95.06
Ganub Elgazira	83.25	75.38	88.98	46.58	37.10	55.92	90.67	86.49	94.64
El Hassahisa	90.14	84.73	94.09	42.55	34.59	51.73	98.82	97.17	99.81
El Kamlin	86.65	81.02	92.25	54.36	47.92	60.86	96.76	94.05	98.96
Sharg El Gezira	92.71	87.17	96.42	42.03	33.59	50.44	96.42	91.70	99.62
Um Elqura	90.12	84.78	94.56	50.62	43.16	59.60	95.64	93.04	97.97
El Manaqil	87.81	79.14	93.66	42.05	30.65	54.94	96.28	93.01	98.68
El Qurashi	88.00	77.65	95.34	35.25	27.41	44.05	92.61	82.93	98.15
Al-Gazeera State	87.28	81.02	93.55	45.59	36.34	54.85	94.95	90.56	99.33
Sennar	90.02	87.21	92.85	60.09	54.24	66.32	98.36	97.17	99.30
Sharg Sennar	62.33	48.42	76.96	10.05	5.64	14.98	66.32	53.37	78.99
Sinja	81.55	75.70	87.10	56.34	48.26	63.43	96.41	92.68	98.86
Abu Hujar	86.73	79.80	92.47	29.46	19.80	41.06	93.63	89.41	97.17
El Dali	93.43	88.67	97.13	34.72	26.22	42.13	97.35	94.46	99.06
Es Suki	91.20	85.18	95.79	42.83	35.37	51.51	95.80	91.03	99.60
Ed Dinder	95.28	92.51	97.74	31.84	24.94	39.74	98.66	97.14	99.77
Sennar State	85.04	77.76	92.31	39.11	31.50	46.72	91.45	85.25	97.66
Ed Damazine	80.81	73.59	88.48	49.74	40.51	59.47	95.10	91.64	98.07
El Tadamon	97.76	96.01	99.26	22.25	15.27	30.70	98.52	96.79	99.75
El Roseiris	81.29	74.81	87.30	40.36	35.26	45.82	89.98	84.36	94.61
Baw	93.79	84.34	100.00	20.36	14.39	27.82	97.92	92.08	100.00
Geisan	81.58	71.54	91.11	23.81	12.36	38.69	88.14	81.21	93.98
El Kurmuk	17.68	10.13	27.01	57.14	39.18	71.91	73.65	57.29	87.11
Wad El Mahi	82.42	65.93	95.15	51.60	41.73	62.79	98.42	94.26	100.00
Blue Nile State	76.82	68.09	85.55	40.43	30.04	50.83	91.90	85.52	98.27
Kosti	76.91	71.70	82.42	33.85	28.55	40.16	90.34	86.39	93.98
Guli	93.31	89.35	96.60	29.20	24.47	34.87	95.08	91.84	97.73
Tendalti	76.43	67.40	83.59	16.67	11.95	22.07	79.24	72.26	86.23
Es Salam	82.16	76.44	86.86	43.52	33.40	55.10	96.48	92.88	98.61

TABLE 44: Maternal consumption of protein-rich foods by locality and by state

Location	Protein-Rich Animal Sources %			Protein-Rich Plant Sources %			Protein-Rich Any Source %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rabak	77.39	70.71	83.79	36.61	29.94	43.61	88.67	82.42	94.45
El Jabalain	83.05	77.34	88.48	29.25	21.82	35.44	93.93	90.70	96.80
El Diwaim	96.86	94.13	98.64	23.00	15.43	31.77	99.22	97.85	100.00
Um Rimta	94.86	91.63	97.52	33.94	28.01	40.30	98.72	97.21	99.78
El Gitaina	97.77	95.88	99.19	29.08	22.48	37.22	99.80	98.98	100.00
White Nile State	86.16	81.21	91.10	30.23	23.04	37.42	93.53	89.86	97.20
Port Sudan	81.33	74.02	87.59	76.20	70.08	81.63	97.52	95.24	99.13
Swakin	69.68	61.83	77.15	23.08	16.76	29.94	77.62	70.19	85.11
El Gonob Welawlaib	99.49	98.06	100.00	28.93	16.04	41.50	100.00	100.00	100.00
Sinkat	50.10	41.22	60.78	24.87	15.17	34.71	60.63	48.36	72.08
Haya	40.89	32.30	49.59	12.75	7.48	18.70	40.87	31.17	50.39
Dordieb	88.15	80.12	94.58	19.63	10.67	27.80	91.75	84.45	96.72
Tokar	87.05	80.60	92.11	46.11	34.43	56.43	94.39	90.74	97.22
Agig	6.02	1.73	12.39	24.15	11.68	35.97	25.70	14.80	38.47
Gabaot Elma-aadin	86.11	74.34	95.26	62.87	49.19	75.24	99.64	98.12	100.00
Halaeeb (accessible parts)	70.34	55.93	84.94	76.42	50.00	89.41	97.37	89.58	100.00
Red Sea State	64.47	55.98	72.96	40.11	29.89	50.33	73.98	66.29	81.66
Kassala Town	90.70	85.16	95.20	52.80	46.70	59.43	95.15	92.36	97.88
Refi Kassla	65.17	55.66	74.54	32.14	23.96	40.23	77.63	69.56	84.84
Rural Western Kassala	85.96	80.92	90.35	37.93	30.62	46.71	93.06	89.83	95.47
New Halfa	80.53	73.38	87.26	44.43	35.27	54.65	92.32	87.42	95.68
Refi Nahr Atbara	94.75	90.76	97.48	21.64	14.08	30.06	96.43	93.52	98.74
Rural Khashm Elgirba	93.72	88.71	97.49	52.71	45.26	60.88	97.89	94.27	100.00
Rural Wad Elhilaiw	63.69	54.60	71.89	17.19	12.13	23.91	72.15	64.00	80.76
Rural Aroma	98.10	94.50	99.78	12.31	7.19	19.05	98.31	95.61	100.00
Refi North Delta	84.77	73.96	94.11	0.47	0.00	3.66	84.69	73.37	94.69
Refi Hamashkureib	97.31	94.32	99.57	37.42	27.44	48.54	100.00	99.55	100.00
Rural Telkok	88.60	81.34	93.70	34.93	26.80	42.01	95.44	92.03	98.13
Kassala State	86.84	80.65	93.03	35.31	27.32	43.31	92.71	88.34	97.07
Gedaref Town	70.49	58.11	80.45	27.18	20.67	34.56	78.06	67.74	88.82
Middle Geddaref	72.19	55.82	84.40	23.13	14.06	33.66	76.51	61.78	86.93
Elbutana	89.66	83.36	94.65	21.99	15.69	28.54	91.12	84.57	95.78
El Fashaga	70.06	54.02	84.49	9.73	5.31	15.11	72.69	55.35	86.52
El Rahad	59.22	49.16	69.91	21.21	15.21	28.40	63.02	53.44	72.92

TABLE 44: Maternal consumption of protein-rich foods by locality and by state

Location	Protein-Rich Animal Sources %			Protein-Rich Plant Sources %			Protein-Rich Any Source %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Gala-a El Nahal	77.23	64.28	89.49	21.50	12.69	32.40	80.81	67.67	92.68
El Fao	80.22	70.98	88.65	24.78	19.47	29.36	88.20	78.05	95.33
El Qureisha	59.39	49.90	68.22	18.73	10.88	28.79	63.50	54.20	75.29
El Mafaza	76.25	67.31	84.80	9.22	5.43	13.50	79.88	69.96	88.21
Basunda	67.13	55.51	76.98	19.65	13.39	26.74	72.15	59.18	82.28
Western Galabat	54.81	37.96	73.13	44.62	32.87	56.92	87.25	79.51	93.15
Eastern Galabat	71.30	60.58	79.86	24.29	11.39	40.02	86.72	81.30	91.62
Al-Gadarif State	70.42	58.51	82.33	22.24	14.32	30.15	77.71	67.32	88.10
Sheikan	71.29	65.19	77.34	48.91	42.63	54.87	86.57	81.71	91.02
Um Rawaba	68.77	61.99	74.43	54.64	46.47	63.68	91.46	86.97	94.57
Um Dam Haj Ahmed	76.58	67.29	84.33	52.12	40.12	61.86	92.09	84.46	96.57
El Rahad	68.45	59.49	76.99	27.23	19.05	37.75	77.28	67.31	85.36
Bara	82.64	74.63	89.44	55.21	45.30	63.90	96.52	92.79	98.77
Gharb Bara	80.40	71.12	89.15	38.41	28.62	49.83	90.45	80.97	96.53
Soudari	86.13	81.81	89.74	26.46	19.34	34.78	90.63	87.24	93.85
Gebrat El Sheikh	88.44	84.09	91.82	34.76	27.05	42.12	93.03	89.90	95.92
North Kordofan State	76.55	69.71	83.39	43.55	35.14	51.95	89.47	84.23	94.70
Kadugli	53.91	45.15	62.25	57.34	49.30	64.75	84.22	77.73	90.29
Reif Shargi	52.93	44.54	62.25	66.52	55.46	75.84	91.01	83.63	96.88
Dilling	65.96	55.00	75.48	58.99	49.75	66.92	93.83	83.68	97.57
El Quoz	70.80	63.70	77.46	37.84	30.43	46.20	81.62	74.85	88.37
Habila	60.04	50.31	69.40	43.50	31.70	54.90	82.21	74.07	89.95
Abassiya	76.86	71.28	81.96	32.94	23.49	43.63	90.00	85.00	94.08
El Rashad	58.49	48.72	69.08	55.71	46.03	65.63	85.85	77.43	92.43
Abu Jubaiha	80.46	74.80	85.37	37.69	27.83	47.57	91.17	84.00	97.15
El Tadamon	82.48	73.59	89.40	23.75	15.31	33.21	89.30	80.80	95.95
Talodi	78.17	63.31	86.52	56.25	46.15	66.23	96.43	91.66	100.00
Ghadeer	75.96	63.83	88.04	51.40	32.47	72.24	98.70	96.09	100.00
El Leri	64.09	57.34	70.27	69.34	61.42	76.99	97.50	95.09	98.97
Abu Karshola	62.92	53.98	72.03	60.82	54.50	66.62	90.55	84.90	94.43
Delami	58.50	44.16	71.50	72.29	57.31	82.64	93.28	84.34	98.83
South Kordofan State	69.48	61.16	77.80	47.15	37.44	56.86	89.61	83.39	95.83
Abu Zabad	67.52	57.22	77.67	22.97	15.84	31.04	71.29	61.70	79.83
ElKhiwai	77.75	68.93	85.78	28.84	20.72	38.67	83.41	75.37	90.53

TABLE 44: Maternal consumption of protein-rich foods by locality and by state

Location	Protein-Rich Animal Sources %			Protein-Rich Plant Sources %			Protein-Rich Any Source %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ghubaish	59.31	50.43	67.86	12.26	6.89	17.94	63.18	53.42	70.86
El Nuhud	56.12	48.06	62.89	7.06	3.33	10.88	59.10	51.27	66.77
El Idia	76.67	64.58	88.10	35.14	24.10	46.78	78.64	67.77	88.32
Wad Benda	66.20	55.27	76.44	22.90	16.08	30.76	74.38	62.40	83.81
Lagawa	86.62	79.90	92.39	22.66	14.50	31.55	90.74	83.95	95.26
Elsunut	85.38	77.23	91.86	21.14	13.79	29.80	86.97	79.47	93.42
Keilik	88.92	82.99	93.07	39.66	34.26	45.54	93.43	88.11	96.65
Es Salam	65.89	58.34	73.07	22.56	18.47	28.06	70.78	62.68	77.15
Babanusa	81.43	74.72	87.94	29.82	20.35	39.71	86.57	80.00	92.52
Abyei	84.58	80.21	88.36	27.27	17.28	37.11	86.57	82.66	90.10
El Dibab	79.90	71.82	86.46	29.57	19.27	37.57	84.97	76.03	91.67
El Meiram	65.62	54.82	80.59	41.82	31.30	53.25	66.03	55.30	81.22
West Kordofan State	70.53	61.66	79.40	22.32	14.38	30.25	74.11	65.51	82.72
El Fasher	43.87	36.56	50.47	19.53	14.77	24.36	52.54	44.02	59.95
Tawila	30.31	17.96	43.52	14.53	8.22	22.41	40.74	29.15	52.52
Melit	35.33	25.56	46.73	6.02	2.17	12.05	39.14	30.30	49.50
Um Kadada	53.88	42.28	64.97	18.50	12.61	24.86	63.75	54.44	73.41
Kebkabiya	29.95	22.02	38.34	3.14	1.18	5.56	31.60	23.58	40.94
Kutum	43.04	31.24	53.85	16.54	10.91	22.29	48.73	37.39	59.91
El Mahalha	57.06	45.78	66.37	1.12	0.00	3.11	56.74	45.78	66.34
Saraf Omra	23.52	15.29	30.90	4.79	1.36	9.38	26.01	16.89	34.67
El Serief	27.15	20.60	33.28	2.25	0.76	4.27	27.07	21.07	33.93
Dar Elsalam	27.70	18.61	37.28	37.06	26.35	47.45	54.05	42.20	66.18
Kelemando	65.56	57.02	75.41	23.65	18.64	30.14	71.34	62.15	79.86
El Tawisha	58.55	50.40	67.90	3.99	2.11	6.43	60.71	52.58	69.24
Um Baru	79.86	69.69	88.18	11.27	4.46	17.67	82.96	73.44	89.75
El Lait	57.33	48.48	64.77	5.86	2.73	10.12	59.38	51.98	67.20
ELkuma	80.79	71.24	87.95	7.61	1.96	14.76	82.39	73.00	89.02
El Tina	22.22	0.00	44.44	0.00	0.00	0.00	22.22	0.00	44.44
Kernoi	78.76	71.76	85.30	4.91	2.21	8.59	79.79	73.89	86.15
North Darfur State	44.19	33.53	54.85	11.46	6.41	16.51	49.62	38.98	60.25
Nyala South	57.36	49.66	65.38	24.65	18.92	31.90	59.64	51.91	68.41
Nyala North	69.91	33.29	90.52	27.86	6.24	44.95	76.43	43.13	94.39
Es Salam	77.62	73.33	82.51	4.35	1.93	6.67	80.29	75.70	84.68

TABLE 44: Maternal consumption of protein-rich foods by locality and by state

Location	Protein-Rich Animal Sources %			Protein-Rich Plant Sources %			Protein-Rich Any Source %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Wihda	38.76	31.27	51.43	0.00	0.00	1.03	39.57	30.47	50.62
Mershing	66.44	57.14	75.58	11.06	2.73	19.94	69.87	57.84	79.72
Beliel	53.16	46.73	60.81	38.20	28.64	47.52	66.63	59.90	72.55
Nitega	66.50	57.66	76.05	11.34	6.78	17.68	69.15	60.05	79.18
Sharg El Jabal (accessible parts)	33.33	6.67	60.00	0.00	0.00	0.00	33.33	13.33	60.00
Kas	65.19	56.61	72.87	35.82	25.22	45.73	80.56	75.26	86.53
Shattaya	74.83	64.77	83.98	74.83	66.95	81.80	96.90	93.75	98.88
Buram	90.46	86.18	94.61	65.11	57.62	71.71	98.73	96.88	99.80
Gereida	83.20	71.55	92.78	51.58	39.68	62.06	93.85	84.21	98.21
El Sunta	90.62	85.27	95.45	65.34	53.65	76.84	98.58	95.76	100.00
El Radoum	91.51	86.47	95.62	37.32	29.27	46.86	95.97	92.46	98.53
Tulus	87.38	80.00	97.58	18.64	12.24	32.29	90.97	85.18	96.78
Damso	84.21	75.40	91.59	18.09	7.13	38.25	85.76	79.02	92.39
Ed Elfursan	66.47	58.07	74.18	15.64	7.07	25.57	67.38	60.25	74.44
Kubum	71.94	66.80	77.39	0.80	0.00	2.38	72.43	66.89	77.51
Kateila	46.86	39.49	54.07	18.53	10.74	27.93	51.80	42.88	60.17
Rehaid Elbirdi	83.54	77.16	89.51	0.00	0.00	0.00	83.94	76.95	89.61
Um Dafoug	81.55	75.05	87.35	0.00	0.00	0.00	81.75	74.87	87.44
South Darfur State	73.32	62.59	84.05	24.94	15.76	34.12	78.14	68.18	88.10
Abu Jabra	36.95	27.33	48.81	7.98	3.31	14.71	39.53	30.09	50.22
Abu Karinka	30.33	24.03	37.11	17.56	10.21	24.17	37.28	30.37	43.53
Bahr El Arab	12.11	7.86	16.31	4.69	1.92	8.39	15.36	10.13	21.51
Adila	39.71	31.51	48.48	1.46	0.33	3.20	39.86	32.03	47.40
Ed Dain	75.71	64.62	84.85	38.34	29.83	45.72	85.46	73.81	92.21
Assalaya	36.48	25.47	49.84	4.69	0.94	11.09	37.63	26.50	54.18
El Firdous	72.77	63.61	81.80	5.95	2.72	9.92	74.32	65.47	83.82
Shia-ria	68.93	55.08	82.13	0.00	0.00	0.00	68.59	54.96	82.30
Yassin	31.40	21.08	43.33	5.22	2.30	9.05	33.39	22.70	45.06
East Darfur State	41.21	31.64	50.78	10.03	5.15	14.90	44.61	34.90	54.33
El Geneina	84.57	76.33	92.01	22.20	16.63	29.27	87.65	78.08	94.16
Habila	62.68	53.86	71.43	5.71	2.74	9.34	64.98	55.10	76.27
Kulbus	90.64	86.07	94.50	12.55	6.54	18.73	92.21	87.84	95.86
Beida	96.19	90.57	99.52	2.49	0.15	7.68	96.58	91.44	99.53
Foro Baranga	66.13	58.09	73.53	18.07	12.43	24.33	68.62	60.10	76.33

TABLE 44: Maternal consumption of protein-rich foods by locality and by state

Location	Protein-Rich Animal Sources %			Protein-Rich Plant Sources %			Protein-Rich Any Source %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kereneik	72.93	68.30	77.48	16.28	11.71	21.87	77.17	73.19	80.94
Sirba	74.44	65.82	82.13	9.94	4.63	16.70	77.72	68.55	83.75
Jebel Moon	76.20	67.80	85.08	7.86	2.59	14.75	78.52	70.50	84.99
West Darfur State	79.90	72.75	87.04	14.25	8.35	20.14	82.52	75.61	89.42
Zalingi	47.04	37.04	58.61	5.58	3.42	7.98	50.70	41.95	60.38
Wadi Salih	91.13	83.66	97.07	1.65	0.16	3.60	91.21	82.35	97.64
Mukjar	86.59	79.41	93.17	25.00	14.04	38.85	93.93	87.15	98.69
Central Jebel Mara	65.73	53.55	75.52	6.85	1.36	16.21	68.75	57.04	78.02
North Jebel Mara	88.74	80.79	95.95	1.35	0.00	4.73	88.49	80.54	96.33
Bendasi	72.61	62.55	80.98	8.33	4.29	15.10	75.50	66.89	82.40
Nertiti	91.16	86.78	95.88	6.03	2.65	9.95	93.62	90.18	96.39
Azum	92.42	85.46	98.20	3.81	1.53	6.22	93.11	87.07	98.21
Um Dukhun	72.07	61.78	82.57	31.53	19.96	43.49	99.44	98.32	100.00
Central Darfur State	77.19	68.52	85.86	10.18	3.40	16.96	82.39	74.51	90.27

Spatial distribution of women's consumption of protein-rich foods

A high proportion of carers consumed protein-rich foods in the eastern part of the country, but that proportion decreased towards the western part of the country *(see Figure 174)*. A similar pattern was noted for women's consumption of animal sources of protein *(see Figure 170)*. For women's consumption of protein-rich plant sources, there was a slightly increasing trend starting from both the east and the west and moving towards the centre *(see Figure 172)*.

FIGURE 170:
Protein-rich animal sources (raster)

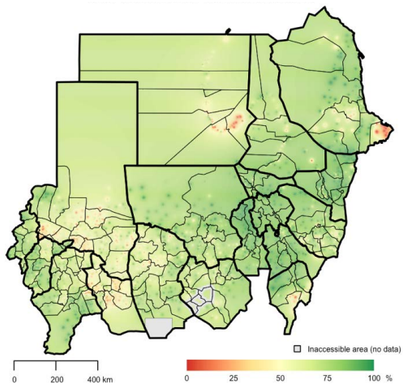


FIGURE 171:
Protein-rich animal sources

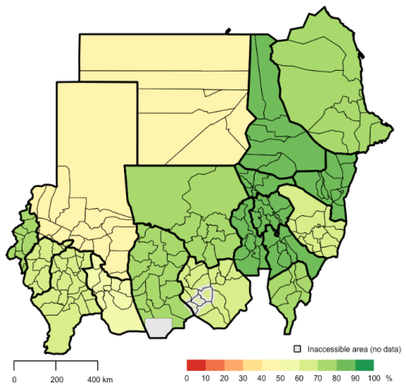


FIGURE 170:
Protein-rich animal sources (raster)

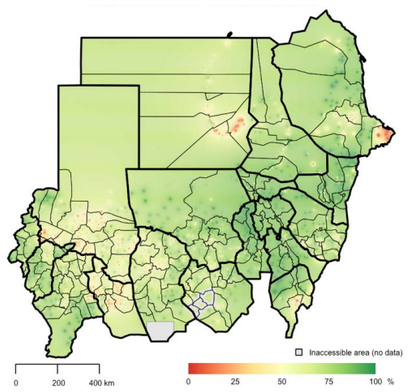


FIGURE 171:
Protein-rich animal sources

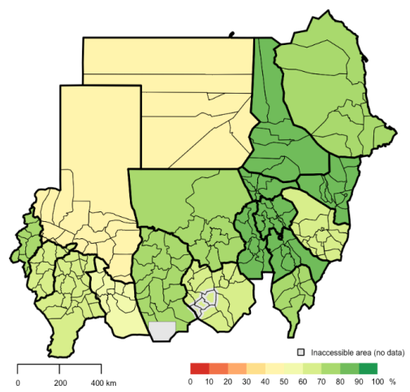


FIGURE 172:
Protein-rich plant sources (raster)

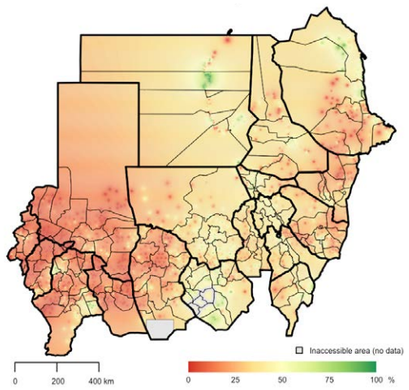


FIGURE 173:
Protein-rich plant sources

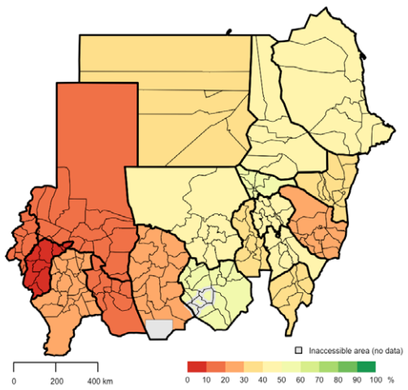


FIGURE 174:
Protein-rich (any source) (raster)

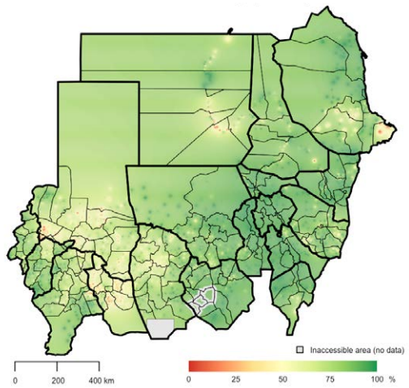
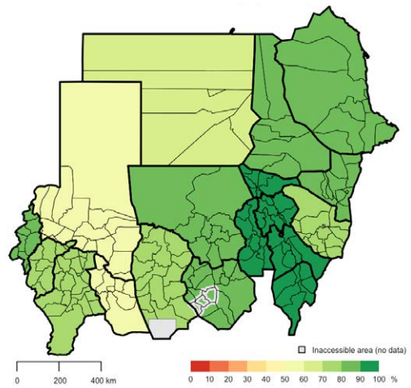


FIGURE 175:
Protein-rich (any source)



3.7.3 Women's consumption of vitamin A-rich foods

Women's consumption of vitamin A-rich foods average results

Vitamin A-rich foods consumption is moderate among carers interviewed, with 67.4 (95 per cent CI: 58.1-76.7 per cent) consuming vitamin A-rich foods from any source in all of Sudan. A majority of carers who consume vitamin A-rich foods obtain theirs from animal sources as opposed to plant sources.

There is considerable variance among states. In 33.3 per cent of states, more than 70 per cent of carers who consume vitamin A-rich foods draw a majority from animal sources. Kassala state had the highest proportion of vitamin A-rich foods consumption from animal sources and from any sources. By contrast, South Darfur state had the highest proportion of vitamin A-rich foods consumption from plant sources. East Darfur state had the lowest vitamin A-rich food consumption from any source *(see Figure 176).*

Across localities, there is also inter-locality variance with 41.6 per cent having more than 70 per cent of carers who consume vitamin A-rich foods, a majority of which is from animal sources. El Gonob Welawlaib locality in Red Sea state had the highest proportion of vitamin A-rich foods consumption from animal sources and any sources, while plant sources provided the highest proportion of vitamin A-rich foods to carers in Tawila locality from North Darfur state. North Jebel Mara locality in Central Darfur had the lowest proportion of vitamin A-rich foods consumption from any source *(see Figure 176).*

Table 45 and Table 46 present by state, by locality and national results of proportion of vitamin A-rich foods consumption from plant sources, animal sources and from any sources.

FIGURE 176: Box plot of state and locality results for carers consumption of vitamin A-rich foods

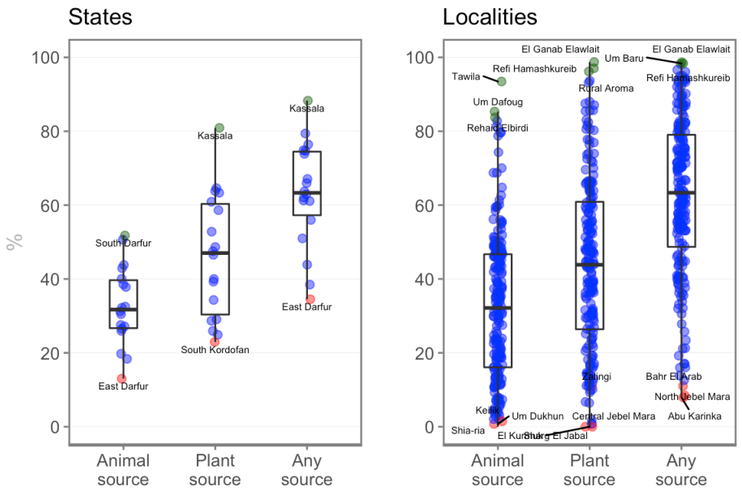


TABLE 45: Maternal consumption of vitamin A-rich foods by state and national

State	Plant Sources of Vitamin A %			Animal Sources of Vitamin A %			Any Source of Vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	38.55	28.74	48.37	39.29	27.90	50.68	62.04	52.02	72.06
Al-Gazeera	32.20	25.04	39.35	63.82	51.92	75.72	73.86	63.42	84.30
Blue Nile	30.47	21.18	39.76	24.90	17.16	32.64	43.88	34.30	53.46
Central Darfur	31.23	21.04	41.42	25.93	15.08	36.78	50.98	39.00	62.97
East Darfur	13.01	6.74	19.28	29.06	20.55	37.57	34.50	25.89	43.10
Kassala	27.55	18.97	36.14	80.91	73.05	88.76	88.28	82.59	93.96
Khartoum	40.04	31.54	48.54	63.32	52.87	73.78	76.43	68.83	84.04
North Darfur	42.92	31.04	54.79	28.69	18.95	38.43	61.10	50.22	71.98
North Kordofan	32.53	23.55	41.52	46.53	37.96	55.10	63.71	54.83	72.60
Northern	50.65	39.73	61.57	34.31	21.35	47.27	67.09	57.52	76.67
Red Sea	18.36	10.16	26.56	58.64	49.08	68.19	65.95	57.26	74.64
River Nile	43.80	36.00	51.60	64.61	56.90	72.32	79.39	72.54	86.23
Sennar	27.16	20.68	33.64	52.81	40.62	64.99	62.92	52.84	73.00
South Darfur	51.79	43.64	59.93	48.66	34.74	62.58	74.87	64.04	85.70
South Kordofan	19.76	10.32	29.20	22.95	14.58	31.33	38.47	28.12	48.82
West Darfur	26.53	16.61	36.46	40.00	29.17	50.84	55.98	45.74	66.22
West Kordofan	25.95	17.73	34.17	47.52	36.73	58.30	61.24	51.50	70.97
White Nile	37.82	29.81	45.82	60.88	52.18	69.58	74.68	67.41	81.95
Sudan	34.83	26.14	43.51	51.18	40.64	61.73	67.36	58.07	76.65

TABLE 46: Women's consumption of vitamin A-rich foods by locality and by state

Location	Plant Sources of Vitamin A %			Animal Sources of Vitamin A %			Any Source of Vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	63.44	52.53	74.20	43.78	33.87	54.87	82.92	74.14	90.37
El Golid	42.58	36.13	49.26	31.84	11.78	50.13	62.68	51.54	74.29
Merwoe	55.94	41.02	69.64	11.99	2.35	24.78	59.42	43.31	71.57
El Daba	46.40	38.28	56.51	31.07	17.75	47.60	60.66	53.14	67.91
Halfa	53.90	48.12	60.86	42.01	35.71	47.74	76.38	71.78	80.18
Delgo	28.17	19.68	35.86	41.02	33.81	48.75	59.36	50.48	68.04
El Burgaig	44.33	37.31	51.80	59.45	49.78	69.15	70.73	63.19	78.41
Northern State	50.65	39.73	61.57	34.31	21.35	47.27	67.09	57.52	76.67
El Matama	35.65	27.74	43.98	51.58	41.96	62.17	65.43	56.55	76.35
Shendi	56.51	48.92	63.67	71.35	64.66	80.07	84.71	80.09	89.80

TABLE 46: Women's consumption of vitamin A-rich foods by locality and by state

Location	Plant Sources of Vitamin A %			Animal Sources of Vitamin A %			Any Source of Vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Hamad	24.00	17.53	29.20	51.82	45.47	57.56	64.27	58.09	71.71
Barbar	39.82	27.62	51.58	46.77	38.11	55.13	74.94	65.26	83.30
El Damar	43.45	36.38	48.73	75.37	70.27	80.15	85.12	80.52	88.94
Atbara	51.21	44.72	57.95	77.80	67.29	85.73	91.30	84.17	95.17
El Buhaira	49.68	42.86	56.80	45.99	38.15	53.64	72.28	66.24	77.25
River Nile State	43.80	36.00	51.60	64.61	56.90	72.32	79.39	72.54	86.23
Khartoum	45.83	38.35	54.12	76.34	63.51	85.27	85.86	79.29	91.05
Bahri	49.34	42.35	56.76	49.80	38.94	61.77	73.72	66.23	82.95
Um Durman	34.99	28.35	42.93	58.99	52.69	66.67	72.82	67.05	79.16
Um Bada	31.18	22.27	40.85	69.46	58.81	79.17	76.05	65.70	85.98
Jebel Awlia	41.37	30.26	50.65	56.39	44.63	68.41	73.79	67.17	80.00
Sharg Elneel	35.42	28.49	43.37	66.42	57.30	76.18	75.74	67.00	83.90
Karrari	45.17	35.22	53.46	64.14	55.02	71.74	77.78	69.41	85.17
Khartoum State	40.04	31.54	48.54	63.32	52.87	73.78	76.43	68.83	84.04
Greater Medani	40.10	34.02	47.94	59.02	50.50	67.49	74.24	68.60	80.90
Ganub Elgazira	41.47	33.15	50.35	63.58	54.82	72.96	78.66	69.98	87.41
El Hassahisa	43.30	36.26	50.30	72.78	62.68	82.40	84.26	77.49	90.12
El Kamlin	45.93	39.23	54.02	65.01	54.62	75.32	79.92	72.82	86.99
Sharg El Gezira	30.74	23.04	37.96	81.80	71.55	88.61	86.21	77.50	91.64
Um Elqura	32.80	21.74	43.59	68.45	56.28	77.72	74.95	66.52	84.60
El Manaqil	14.69	11.01	19.51	44.34	27.19	60.86	52.53	37.81	65.56
El Qurashi	22.82	15.70	30.69	72.01	57.80	84.31	78.25	64.99	89.86
Al-Gazeera State	32.20	25.04	39.35	63.82	51.92	75.72	73.86	63.42	84.30
Sennar	51.64	44.23	58.18	67.18	60.02	73.34	82.46	77.66	86.80
Sharg Sennar	4.80	1.92	8.62	46.82	35.16	59.17	49.30	35.78	64.53
Sinja	32.93	25.88	40.22	43.62	34.06	52.50	55.89	48.65	63.66
Abu Hujar	21.71	13.53	30.94	61.46	46.64	75.98	72.32	61.54	82.59
El Dali	11.49	6.42	17.59	49.15	37.07	62.06	53.96	42.61	64.98
Es Suki	35.91	28.99	43.79	52.24	39.21	63.53	65.41	54.18	78.78
Ed Dinder	11.06	6.96	16.24	40.47	27.33	55.14	47.61	35.40	60.42
Sennar State	27.16	20.68	33.64	52.81	40.62	64.99	62.92	52.84	73.00
Ed Damazine	41.86	32.72	49.94	25.83	15.93	35.96	50.84	42.85	59.50
El Tadamon	36.48	28.80	45.59	44.36	38.70	49.39	50.12	44.59	54.83
El Roseiris	43.31	33.52	53.43	22.69	15.42	30.89	55.77	45.94	68.27
Baw	15.29	10.00	21.77	53.39	44.62	65.03	57.01	50.85	66.67
Geisan	19.21	14.63	24.61	13.95	7.81	19.25	28.80	22.10	35.99
El Kurmuk	15.23	2.00	31.28	0.00	0.00	0.00	16.09	2.81	34.22
Wad El Mahi	21.62	14.14	28.15	17.70	10.55	25.25	31.70	24.59	37.92

TABLE 46: Women's consumption of vitamin A-rich foods by locality and by state

Location	Plant Sources of Vitamin A %			Animal Sources of Vitamin A %			Any Source of Vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Blue Nile State	30.47	21.18	39.76	24.90	17.16	32.64	43.88	34.30	53.46
Kosti	42.86	36.02	50.32	32.14	23.93	41.27	61.76	54.72	69.80
Guli	9.64	5.33	15.02	77.88	71.43	84.29	78.14	71.64	84.65
Tendalti	16.23	11.95	21.45	58.06	49.17	68.34	67.66	60.54	74.66
Es Salam	22.38	15.91	28.92	58.76	48.39	69.16	66.67	56.45	76.63
Rabak	43.12	33.89	52.02	45.30	33.20	56.42	63.75	52.82	74.43
El Jabalain	20.45	14.36	27.38	45.80	35.97	55.18	60.19	52.94	67.69
El Diwaim	57.28	49.29	64.32	78.68	71.50	85.28	89.19	84.41	93.37
Um Rimta	50.63	40.36	60.80	93.10	89.96	95.97	96.62	94.23	98.36
El Gitaina	40.73	31.28	51.13	89.31	82.52	93.96	93.96	90.14	96.96
White Nile State	37.82	29.81	45.82	60.88	52.18	69.58	74.68	67.41	81.95
Port Sudan	39.45	31.34	46.17	61.72	48.83	73.18	76.15	66.10	84.44
Swakin	15.30	9.03	21.90	59.41	51.59	68.57	68.56	60.81	77.09
El Gonob Welawlaib	13.02	5.55	23.21	99.50	97.69	100.00	99.49	98.07	100.00
Sinkat	19.38	12.85	26.54	48.48	37.80	59.60	57.91	47.10	67.79
Haya	7.66	2.49	13.54	40.43	31.42	48.27	41.97	32.96	52.61
Dordieb	9.74	1.98	21.33	88.13	80.10	94.23	90.06	82.06	95.64
Tokar	16.19	4.15	29.20	85.82	79.36	91.14	89.12	82.52	94.40
Agig	16.20	7.30	29.30	0.86	0.00	2.42	17.46	7.29	29.15
Gabaot Elma-aadin	22.28	14.22	30.58	81.82	65.49	91.92	87.12	79.02	93.86
Halaeeb (accessible parts)	11.36	4.61	18.09	67.74	53.19	82.36	75.36	61.24	87.26
Red Sea State	18.36	10.16	26.56	58.64	49.08	68.19	65.95	57.26	74.64
Kassala Town	46.63	38.22	56.18	85.34	78.24	91.32	94.49	90.89	96.40
Refi Kassla	33.33	25.14	42.37	57.99	48.23	68.79	72.80	64.51	81.01
Rural Western Kassala	17.67	11.66	23.62	74.95	65.63	82.63	76.96	68.28	84.70
New Halfa	36.35	23.48	50.18	63.90	53.56	72.66	78.30	69.68	84.67
Refi Nahr Atbara	37.18	29.20	44.96	81.51	71.36	87.41	91.81	86.75	95.59
Rural Khashm Elgirba	51.99	47.09	57.48	93.71	88.26	97.49	95.12	91.23	97.94
Rural Wad Elhilaiw	39.87	32.88	45.83	46.02	33.03	59.12	73.23	65.00	80.73
Rural Aroma	2.78	0.24	6.93	97.35	92.12	99.59	97.48	92.82	99.78
Refi North Delta	3.85	0.23	10.14	84.93	74.94	94.07	86.44	77.10	93.71
Refi Hamashkureib	17.39	10.76	25.31	97.22	94.53	99.38	98.33	96.44	99.78
Rural Telkok	6.64	1.06	15.74	87.50	78.83	93.39	89.86	85.65	94.01
Kassala State	27.55	18.97	36.14	80.91	73.05	88.76	88.28	82.59	93.96
Gedaref Town	47.58	38.52	57.10	45.92	34.05	60.47	66.83	57.09	76.00
Middle Geddaref	34.62	22.86	44.24	42.83	32.57	52.46	64.16	56.70	71.53

TABLE 46: Women's consumption of vitamin A-rich foods by locality and by state

Location	Plant Sources of Vitamin A %			Animal Sources of Vitamin A %			Any Source of Vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Elbutana	30.86	22.50	39.96	80.47	72.96	85.94	86.65	78.91	91.86
El Fashaga	14.12	7.72	21.37	43.35	27.42	61.76	55.95	42.00	71.27
El Rahad	46.93	35.41	57.83	9.68	1.81	20.08	50.00	36.85	61.68
Gala-a El Nahal	63.40	52.77	76.01	38.66	30.72	48.15	76.47	65.28	85.42
El Fao	15.14	9.33	20.61	54.45	45.51	62.49	62.46	56.48	68.71
El Qureisha	29.20	22.00	37.09	29.69	19.50	40.36	44.06	34.02	54.03
El Mafaza	48.33	31.91	64.08	43.16	27.52	56.17	71.32	55.97	82.99
Basunda	41.60	33.40	50.23	39.07	26.84	51.85	66.17	57.23	73.12
Western Galabat	32.80	25.70	40.82	32.88	21.55	47.08	53.49	43.97	62.95
Eastern Galabat	49.26	44.20	55.06	26.28	18.95	36.02	56.26	50.00	63.23
Al-Gadarif State	38.55	28.74	48.37	39.29	27.90	50.68	62.04	52.02	72.06
Sheikan	46.44	38.58	53.03	36.30	28.98	42.52	61.11	52.06	69.79
Um Rawaba	31.59	23.85	39.78	37.20	30.14	44.03	55.19	47.63	62.80
Um Dam Haj Ahmed	33.26	20.98	46.02	30.22	23.72	38.05	53.59	38.54	65.47
El Rahad	42.93	33.21	52.15	30.17	18.62	40.40	62.07	52.96	70.30
Bara	20.75	12.78	30.50	46.73	38.44	54.85	57.79	49.07	66.43
Gharb Bara	20.18	12.32	27.98	57.20	44.88	68.07	67.28	55.10	75.99
Soudari	22.58	14.89	31.91	65.08	56.86	73.61	74.53	66.01	81.33
Gebrat El Sheikh	24.76	15.17	34.66	76.82	68.36	83.38	81.65	73.62	89.11
North Kordofan State	32.53	23.55	41.52	46.53	37.96	55.10	63.71	54.83	72.60
Kadugli	13.02	9.21	16.97	13.17	8.38	19.42	23.38	18.08	29.64
Reif Shargi	4.40	2.26	7.80	9.92	4.25	21.01	13.22	6.42	24.69
Dilling	30.84	19.20	41.03	20.97	14.22	30.08	45.27	35.07	54.13
El Quoz	22.65	14.28	31.84	25.29	20.04	33.46	40.08	31.85	49.04
Habila	8.70	2.35	15.96	25.24	18.10	34.42	30.44	20.87	40.93
Abassiya	35.63	22.91	47.06	11.59	5.59	18.76	42.24	31.93	54.28
El Rashad	16.01	9.11	24.31	25.00	14.42	35.13	34.93	22.81	45.81
Abu Jubaiha	7.56	2.65	14.72	49.81	37.09	61.53	53.85	40.86	65.36
El Tadamon	42.72	28.10	55.71	18.36	12.40	25.49	55.58	45.28	64.97
Talodi	22.38	10.87	32.41	15.83	7.06	30.51	34.03	19.84	46.83
Ghadeer	12.08	4.43	27.98	14.56	9.19	20.33	20.83	14.09	33.80
El Leri	3.11	0.62	6.21	10.54	6.77	15.31	13.51	9.97	17.57
Abu Karshola	14.50	7.29	24.10	19.33	12.20	28.27	30.87	22.66	41.37
Delami	4.78	1.14	11.11	12.70	4.15	23.29	16.54	7.74	25.72
South Kordofan State	19.76	10.32	29.20	22.95	14.58	31.33	38.47	28.12	48.82
Abu Zabad	12.57	6.44	22.05	36.31	27.30	45.93	44.79	34.25	54.61
ElKhiwai	13.93	7.87	20.89	50.73	40.29	60.97	55.93	47.66	65.81

TABLE 46: Women's consumption of vitamin A-rich foods by locality and by state

Location	Plant Sources of Vitamin A %			Animal Sources of Vitamin A %			Any Source of Vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ghubaish	30.35	18.45	41.44	35.88	27.37	45.34	56.25	46.97	66.43
El Nuhud	35.56	27.25	43.93	42.07	34.16	51.14	60.92	54.65	66.67
El Idia	31.05	24.89	36.20	63.88	50.96	80.27	74.80	64.72	83.83
Wad Benda	22.03	12.34	34.79	43.62	34.18	53.94	53.83	39.65	64.97
Lagawa	46.31	38.32	53.95	48.20	36.58	59.90	71.23	64.65	78.22
Elsunut	8.92	3.05	17.87	65.30	56.75	74.25	68.90	58.61	77.20
Keilik	1.46	0.00	6.07	40.87	33.17	49.28	40.89	32.51	49.87
Es Salam	44.95	36.25	52.80	52.78	46.05	58.52	79.57	73.51	84.52
Babanusa	33.68	26.61	39.27	67.49	51.78	78.34	74.56	66.22	83.30
Abyei	18.90	13.83	24.51	44.42	31.72	55.25	57.72	46.66	67.24
El Dibab	13.99	3.65	24.73	44.79	35.10	54.65	53.19	41.41	64.02
El Meiram	27.65	17.79	36.03	43.20	30.00	63.66	69.59	61.40	81.15
West Kordofan State	25.95	17.73	34.17	47.52	36.73	58.30	61.24	51.50	70.97
El Fasher	41.54	35.58	47.97	22.50	17.25	27.60	53.09	46.41	59.94
Tawila	93.68	90.89	96.28	17.07	9.07	26.03	95.32	92.45	97.55
Melit	42.42	25.37	59.50	24.69	15.86	34.39	57.94	47.45	71.46
Um Kadada	10.62	6.40	15.24	39.10	31.78	47.38	46.06	38.28	53.59
Kebkabiya	79.57	71.62	88.35	22.04	15.43	29.72	92.47	89.44	95.14
Kutum	65.29	56.00	73.26	27.02	18.58	36.41	79.62	72.64	85.47
El Mahalha	2.80	0.84	5.85	53.45	42.96	62.58	55.38	43.81	66.25
Saraf Omra	48.74	26.01	70.74	16.63	9.78	24.17	58.49	35.48	76.74
El Serief	6.15	3.00	9.97	19.63	15.22	25.11	23.64	18.54	28.55
Dar Elsalam	40.38	35.19	45.75	10.84	5.43	16.71	47.52	40.00	55.99
Kelemando	49.50	44.61	54.85	31.63	22.19	40.33	65.86	58.65	73.11
El Tawisha	5.25	1.97	9.50	36.00	29.24	43.26	39.77	33.49	45.97
Um Baru	88.54	72.21	95.75	65.26	52.63	78.66	98.64	89.67	100.00
El Lait	33.41	23.95	40.55	13.91	9.58	19.69	39.73	31.78	48.25
ELkuma	23.31	11.79	36.52	51.47	39.68	63.57	65.62	50.57	80.77
El Tina	55.56	22.22	88.89	11.11	0.00	33.33	66.67	33.33	88.89
Kernoi	44.19	38.78	48.79	67.65	61.21	74.38	84.40	78.71	89.71
North Darfur State	42.92	31.04	54.79	28.69	18.95	38.43	61.10	50.22	71.98
Nyala South	25.16	19.73	31.09	34.03	25.74	44.20	49.08	41.86	57.12
Nyala North	23.57	10.81	35.65	48.57	11.56	76.36	56.25	22.91	83.22
Es Salam	48.38	41.19	56.39	35.91	28.47	41.96	68.62	61.56	76.29
El Wihda	40.85	27.76	52.70	16.97	11.00	24.19	52.98	39.94	64.07
Mershing	67.65	57.47	78.15	30.87	18.70	42.00	81.79	75.23	88.71
Beliel	48.77	43.65	53.64	12.48	7.26	18.73	54.80	50.04	58.45

TABLE 46: Women's consumption of vitamin A-rich foods by locality and by state

Location	Plant Sources of Vitamin A %			Animal Sources of Vitamin A %			Any Source of Vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nitega	29.65	23.35	36.79	48.29	36.60	58.70	64.02	57.25	70.33
Sharg El Jabal (accessible parts)	40.00	20.00	60.00	0.00	0.00	0.00	40.00	13.33	66.67
Kas	60.25	53.78	67.03	43.80	36.07	52.20	78.37	71.72	84.05
Shattaya	78.15	72.29	85.27	50.00	37.87	65.94	90.56	85.19	94.78
Buram	46.68	40.84	51.66	61.37	50.49	69.59	75.30	70.00	81.52
Gereida	74.50	62.48	84.02	53.16	37.94	65.63	87.85	80.23	94.55
El Sunta	24.86	18.21	31.17	64.59	56.82	72.74	68.47	60.00	76.21
El Radoum	49.82	43.88	56.05	60.58	50.16	72.58	78.60	70.86	86.17
Tulus	50.63	43.19	63.77	73.53	62.80	84.43	93.41	89.00	97.94
Damso	47.20	39.78	53.94	45.89	28.77	64.23	74.57	62.48	87.48
Ed Elfursan	80.43	70.05	87.98	59.63	49.43	68.89	93.69	86.65	98.43
Kubum	59.18	53.59	65.29	38.40	32.64	44.85	78.09	72.96	82.51
Kateila	69.62	55.39	80.56	25.23	17.53	33.74	73.29	60.00	86.84
Rehaid Elbirdi	83.68	79.31	88.14	55.79	45.68	66.70	94.11	91.30	96.56
Um Dafoug	85.35	80.64	89.45	61.44	52.51	69.52	93.48	89.48	97.01
South Darfur State	51.79	43.64	59.93	48.66	34.74	62.58	74.87	64.04	85.70
Abu Jabra	21.15	12.87	29.24	32.40	25.00	41.46	40.53	31.75	50.13
Abu Karinka	5.31	2.32	10.07	14.01	8.35	21.30	17.40	10.56	27.06
Bahr El Arab	9.27	5.62	13.53	1.89	0.31	4.38	11.18	7.74	15.78
Adila	2.15	0.00	7.56	36.65	28.93	44.33	37.93	28.92	46.88
Ed Dain	13.01	7.14	20.04	33.45	24.63	43.27	40.47	31.20	50.57
Assalaya	10.17	2.63	19.09	35.10	24.32	46.88	36.86	23.81	50.95
El Firdous	58.71	51.78	67.43	64.52	53.48	75.12	79.95	72.49	87.64
Shia-ria	0.00	0.00	1.03	61.30	50.40	72.42	61.79	50.91	72.22
Yassin	6.67	3.74	10.66	12.62	6.90	19.69	18.73	13.09	23.96
East Darfur State	13.01	6.74	19.28	29.06	20.55	37.57	34.50	25.89	43.10
El Geneina	43.00	33.89	51.49	56.23	43.80	67.79	73.03	64.16	80.89
Habila	7.57	0.86	15.23	39.51	25.24	51.76	45.28	30.50	60.03
Kulbus	11.84	6.00	20.33	38.79	28.85	49.89	45.59	35.77	55.38
Beida	12.86	4.84	23.90	79.66	67.80	89.51	88.59	82.12	93.34
Foro Baranga	43.23	32.72	53.28	28.04	19.92	35.79	57.35	47.48	66.13
Kereneik	25.85	18.12	35.62	14.73	10.51	18.91	35.02	26.11	43.37
Sirba	22.78	11.92	35.09	12.89	5.30	23.87	34.31	20.97	46.98
Jebel Moon	16.52	6.20	29.01	30.18	17.45	46.91	47.03	35.68	58.42
West Darfur State	26.53	16.61	36.46	40.00	29.17	50.84	55.98	45.74	66.22
Zalingi	9.04	5.55	12.75	21.49	14.11	30.54	28.41	20.61	36.93
Wadi Salih	38.69	26.18	51.22	30.82	18.59	44.56	61.76	50.98	71.12

TABLE 46: Women's consumption of vitamin A-rich foods by locality and by state

Location	Plant Sources of Vitamin A %			Animal Sources of Vitamin A %			Any Source of Vitamin A %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Mukjar	12.24	4.30	22.23	54.80	44.85	67.57	63.15	51.30	73.75
Central Jebel Mara	82.98	62.87	95.07	0.00	0.00	0.00	82.01	63.26	95.31
North Jebel Mara	6.21	1.32	15.66	0.74	0.00	4.08	7.53	2.00	16.67
Bendasi	48.00	37.67	59.69	32.13	23.82	44.02	63.12	52.55	73.63
Nertiti	27.25	16.69	38.18	21.62	11.41	30.57	42.57	35.90	48.56
Azum	50.77	42.96	57.76	54.99	39.60	69.39	80.35	72.13	88.02
Um Dukhun	0.56	0.00	1.53	26.67	12.80	42.99	25.66	12.11	43.29
Central Darfur State	31.23	21.04	41.42	25.93	15.08	36.78	50.98	39.00	62.97

Spatial distribution of women's consumption of vitamin A-rich foods

The spatial pattern of vitamin A-rich foods consumption from plant sources was evenly low, but with pockets of higher consumption in Northern State and in North and South Darfur states *(see Figure 177)*. There was a decreasing spatial trend of vitamin A-rich foods consumption from animal sources from the east to the west of the country: areas of Red Sea state and Kassala state had higher consumption, while the states in Darfur and the south had a low level of consumption *(see Figure 179)*.

FIGURE 177:
Consumes plant sources of vitamin A (raster)

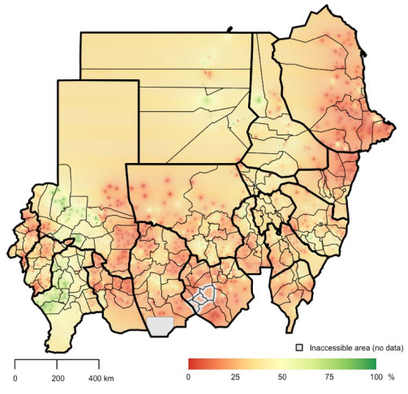


FIGURE 178:
Consumes plant sources of vitamin A

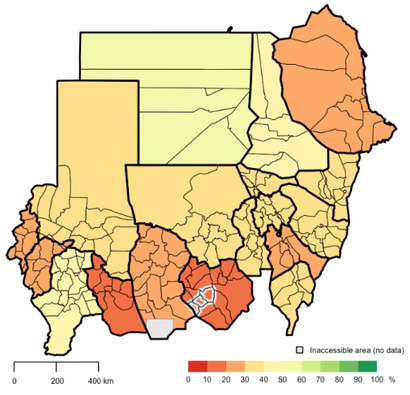


FIGURE 179:
Consumes animal sources of vitamin A (raster)

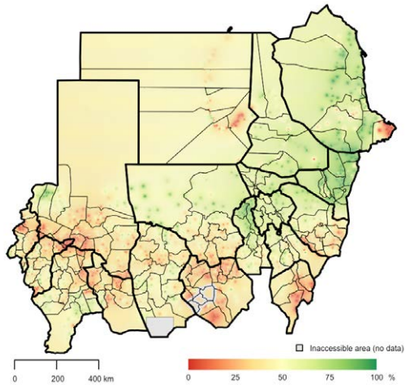


FIGURE 180:
Consumes animal sources of vitamin A

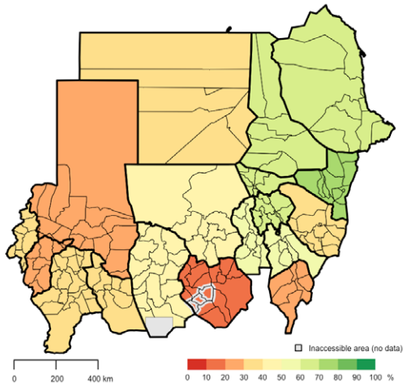


FIGURE 181:
Consumes any source of vitamin A (raster)

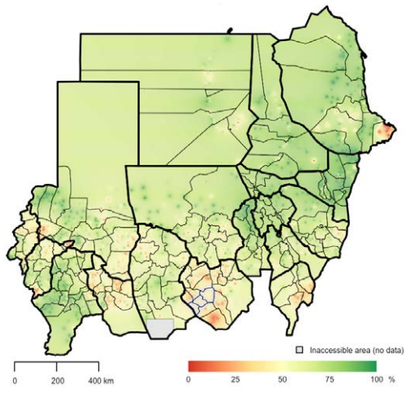
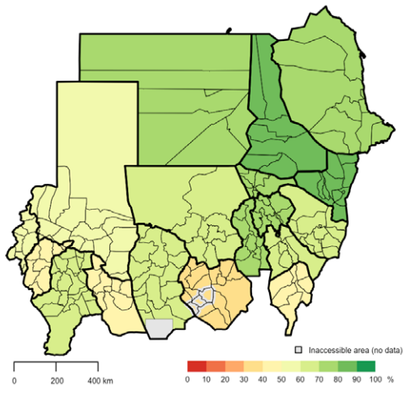


FIGURE 182:
Consumes any source of vitamin A



3.7.4 Women's consumption of iron-, calcium- and zinc-rich foods

Women's consumption of iron, calcium and zinc average results

Consumption of iron-rich foods was relatively high among women interviewed at 66.8 per cent (95 per cent CI: 57.6-75.9 per cent). Of the states, 44.4 per cent had more than 70 per cent of women who consumed iron-rich foods. Blue Nile state had the highest proportion of iron-rich foods consumption, while Red Sea state had the lowest *(see Figure 183)*. Among localities there was slightly greater variability in the proportion of iron-rich foods consumption: specifically, 47 per cent had more than 70 per cent of women who consumed iron-rich foods. El Tadamon locality in Blue Nile state had the highest proportion of iron-rich foods consumption. There were nine localities (two from East Darfur, three from Kassala, three from Red Sea and one from North Darfur) with very low iron-rich foods consumption *(see Figure 183)*.

Consumption of calcium-rich foods was relatively low among women interviewed, at 47.7 per cent (95 per cent CI: 37.1-58.3 per cent). Of the states, 5.6 per cent had more than 70 per cent of women who consumed calcium-rich foods. Kassala state had the highest proportion of calcium-rich foods consumption, while Blue Nile state had the lowest *(see Figure 183)*. Among localities there was greater

variability in the proportion of calcium-rich foods consumption: specifically, 14.1 per cent of localities had more than 70 per cent of women who consumed calcium-rich foods. El Gonob Welawlaib locality in Red Sea state had the highest proportion of calcium-rich foods consumption. The lowest proportion of calcium-rich foods consumption occurred in the following places: El Kurmuk locality in Blue Nile state; Central Jebel Mara locality in Central Darfur state; Bahr El Arab locality in East Darfur state; and Sharg El Jabal (accessible parts) locality in South Darfur state *(see Figure 183)*.

Consumption of zinc-rich foods was relatively low among women interviewed at 69.7 per cent (95 per cent CI: 61.4-78.0 per cent) across Sudan. Of the states, 50 per cent had more than 70 per cent of women who consumed zinc-rich foods. Blue Nile state had the highest proportion of zinc-rich foods consumption, while East Darfur state had the lowest *(see Figure 183)*. Among localities, there was greater variability in the proportion of zinc-rich foods consumption: specifically, 49.2 per cent of localities had more than 70 per cent of women who consumed zinc-rich foods. Wad El Mahi locality in Blue Nile state had the highest proportion of zinc-rich foods consumption, while Refi North Delta locality in Kassala state had the lowest *(see Figure 183)*.

Table 47 and Table 48 present by state, by locality and national level results of the proportion of iron-, calcium- and zinc-rich foods consumption.

FIGURE 183: Box plot of state and locality results for carers consumption of foods rich in iron, calcium and zinc

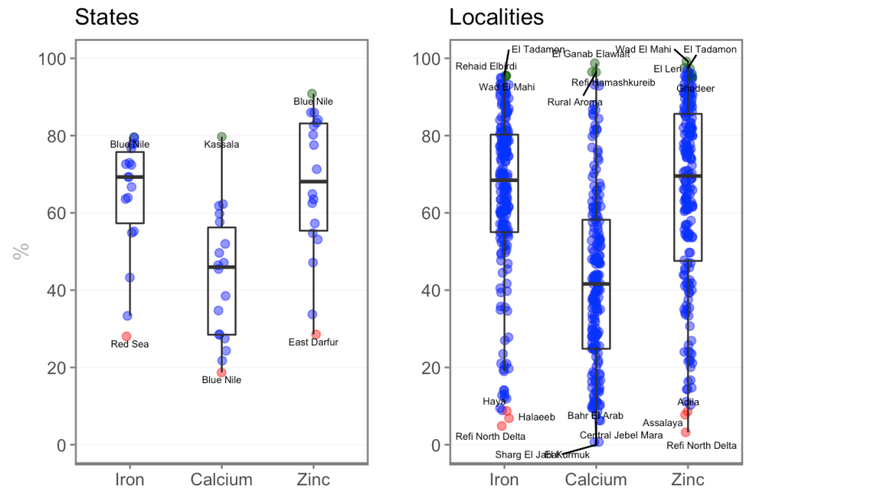


TABLE 47: Women's consumption of iron-, calcium- and zinc-rich foods by state and national

State	Iron-Rich Foods %			Calcium-Rich Foods %			Zinc-Rich Foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	69.27	60.17	78.38	34.73	23.08	46.39	63.50	53.35	73.66
Al-Gazeera	77.77	70.27	85.26	62.26	50.20	74.32	85.96	79.48	92.44

TABLE 47: Women's consumption of iron-, calcium- and zinc-rich foods by state and national

State	Iron-Rich Foods %			Calcium-Rich Foods %			Zinc-Rich Foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Blue Nile	79.64	70.30	88.98	18.69	10.76	26.61	90.85	83.86	97.85
Central Darfur	72.96	62.72	83.19	24.31	13.03	35.60	77.54	68.82	86.27
East Darfur	33.35	24.82	41.88	28.42	20.40	36.44	28.53	20.73	36.33
Kassala	43.26	32.43	54.08	79.69	71.79	87.58	54.75	45.75	63.76
Khartoum	72.39	63.88	80.90	51.97	41.58	62.37	84.07	78.03	90.11
North Darfur	55.21	43.42	67.00	27.50	17.73	37.27	33.75	24.40	43.09
North Kordofan	69.30	60.15	78.46	45.48	37.22	53.74	80.21	72.84	87.58
Northern	54.84	45.13	64.55	28.61	15.99	41.24	53.12	39.69	66.56
Red Sea	28.04	17.36	38.71	57.65	47.62	67.67	47.15	37.26	57.03
River Nile	63.93	55.55	72.31	61.81	53.86	69.77	62.51	53.58	71.45
Sennar	76.68	69.24	84.12	49.63	37.57	61.69	82.52	75.67	89.37
South Darfur	79.46	69.15	89.77	47.12	33.19	61.05	64.89	54.18	75.60
South Kordofan	66.72	57.59	75.86	21.75	13.51	29.98	85.96	79.16	92.76
West Darfur	72.61	63.62	81.61	38.51	27.73	49.30	71.30	60.89	81.70
West Kordofan	63.60	54.09	73.11	46.45	35.34	57.56	57.27	47.11	67.43
White Nile	77.95	71.86	84.04	59.79	51.50	68.09	83.36	77.74	88.98
Sudan	66.75	57.61	75.89	47.69	37.12	58.26	69.72	61.40	78.04

TABLE 48: Women's consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-Rich Foods %			Calcium-Rich Foods %			Zinc-Rich Foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	70.90	63.70	77.60	35.78	25.82	45.15	51.82	40.91	62.67
El Golid	54.82	46.06	64.67	29.01	11.12	48.45	34.50	14.10	56.77
Merwoe	34.41	21.78	46.69	10.61	0.64	22.84	67.96	57.95	80.28
El Daba	49.06	41.05	57.55	24.59	10.74	37.82	34.75	19.92	49.73
Halfa	79.17	70.78	86.96	27.76	21.17	35.82	55.63	45.45	67.20
Delgo	60.83	51.37	70.89	25.05	18.20	33.47	97.29	94.24	99.37
El Burgaig	59.55	52.41	66.12	53.58	43.83	65.91	55.91	47.60	67.08
Northern State	54.84	45.13	64.55	28.61	15.99	41.24	53.12	39.69	66.56
El Matama	80.22	74.27	85.38	51.08	42.41	60.78	79.78	74.31	85.50
Shendi	66.79	60.71	72.51	71.71	63.90	79.03	41.36	30.78	52.45
Abu Hamad	37.50	29.95	45.94	49.12	42.31	56.04	44.67	34.92	54.09
Barbar	41.89	26.88	54.42	42.77	32.20	53.60	47.01	35.81	58.64

TABLE 48: Women's consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-Rich Foods %			Calcium-Rich Foods %			Zinc-Rich Foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Damar	67.44	60.83	74.25	70.17	63.48	75.90	80.09	73.07	85.12
Atbara	79.76	73.02	85.67	73.50	62.67	81.22	82.61	74.33	89.03
El Buhaira	68.41	61.99	74.59	45.40	38.36	52.14	63.13	57.29	68.76
River Nile State	63.93	55.55	72.31	61.81	53.86	69.77	62.51	53.58	71.45
Khartoum	81.21	75.67	86.40	67.39	56.62	77.01	87.43	83.00	91.76
Bahri	76.00	70.04	81.56	40.67	30.41	53.23	76.57	69.06	82.65
Um Durman	70.54	63.46	76.62	52.96	46.21	59.16	85.99	78.20	91.65
Um Bada	62.26	52.84	72.29	47.74	38.34	57.63	93.35	86.95	96.76
Jebel Awlia	78.72	72.41	84.28	44.35	31.05	57.94	77.11	71.12	83.22
Sharg Elneel	70.09	60.88	77.55	57.25	46.91	66.86	81.45	74.99	87.04
Karrari	69.89	59.81	80.15	54.89	48.18	63.50	85.44	78.85	90.64
Khartoum State	72.39	63.88	80.90	51.97	41.58	62.37	84.07	78.03	90.11
Greater Medani	75.35	69.91	80.75	55.57	46.88	63.87	83.56	78.55	88.22
Ganub Elgazira	71.33	62.85	79.57	62.61	52.16	73.22	79.08	73.22	85.49
El Hassahisa	83.21	78.48	87.53	71.60	61.81	80.85	90.06	85.38	94.22
El Kamlin	73.22	64.32	81.42	61.62	49.03	71.67	83.23	76.04	87.71
Sharg El Gezira	76.36	68.69	82.61	80.91	71.48	87.58	85.93	75.50	93.15
Um Elqura	79.84	73.35	85.76	67.88	55.54	78.24	83.92	78.43	88.74
El Manaqil	81.12	75.28	86.47	44.06	29.77	60.03	92.12	88.29	95.75
El Qurashi	77.68	66.59	86.99	70.05	56.75	83.80	83.55	70.34	92.07
Al-Gazeera State	77.77	70.27	85.26	62.26	50.20	74.32	85.96	79.48	92.44
Sennar	86.19	82.23	90.21	60.79	54.86	67.34	94.80	92.49	97.07
Sharg Sennar	34.26	21.88	48.46	47.33	34.23	60.52	39.35	28.54	52.81
Sinja	78.96	72.72	84.00	36.98	28.85	46.43	92.06	87.13	96.00
Abu Hujar	80.86	71.92	87.39	59.36	42.78	74.24	83.58	74.38	90.37
El Dali	87.19	79.70	92.64	48.21	34.74	59.98	90.84	85.42	95.05
Es Suki	88.21	84.26	91.86	48.21	36.18	62.46	91.25	86.69	95.17
Ed Dinder	90.85	80.35	96.40	40.59	26.25	55.12	94.67	86.75	98.89
Sennar State	76.68	69.24	84.12	49.63	37.57	61.69	82.52	75.67	89.37
Ed Damazine	85.10	79.67	89.71	20.86	12.60	30.57	93.55	89.45	97.13
El Tadamon	95.58	90.05	99.75	43.67	37.53	49.05	97.52	95.76	98.77
El Roseiris	84.28	79.78	88.21	19.02	12.22	26.93	88.90	84.15	93.48
Baw	91.12	81.67	98.53	25.37	16.65	42.05	96.45	89.91	100.00
Geisan	86.44	76.19	94.24	8.51	5.05	13.31	86.91	79.62	92.49
El Kurmuk	28.51	15.54	44.24	0.00	0.00	0.00	73.47	56.10	85.62
Wad El Mahi	82.42	66.00	95.25	15.26	9.07	24.22	98.42	94.53	100.00
Blue Nile State	79.64	70.30	88.98	18.69	10.76	26.61	90.85	83.86	97.85
Kosti	79.91	74.29	84.93	31.17	23.33	39.77	87.00	83.35	91.03
Guli	65.52	55.28	73.25	77.08	70.34	83.24	73.75	66.07	80.38

TABLE 48: Women's consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-Rich Foods %			Calcium-Rich Foods %			Zinc-Rich Foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Tendalti	57.52	49.79	64.98	56.07	44.79	67.53	56.07	49.00	63.36
Es Salam	73.35	66.53	79.73	59.24	48.23	67.64	90.00	82.38	96.12
Rabak	71.58	65.03	77.77	43.29	31.84	55.44	76.83	68.67	83.86
El Jabalain	76.40	70.46	83.08	45.27	35.33	54.56	84.47	80.15	88.50
El Diwaim	91.05	86.86	95.30	78.24	70.62	84.80	89.84	85.85	93.13
Um Rimta	76.91	69.38	83.01	93.26	89.84	96.24	79.91	73.51	84.68
El Gitaina	87.12	81.07	92.14	89.00	81.83	93.84	95.99	91.91	99.17
White Nile State	77.95	71.86	84.04	59.79	51.50	68.09	83.36	77.74	88.98
Port Sudan	68.81	58.09	76.62	56.75	44.60	67.88	93.67	89.82	96.87
Swakin	29.32	17.95	42.14	58.32	51.16	66.92	37.83	29.82	48.17
El Gonob Welawlaib	29.10	9.94	47.27	99.36	98.00	100.00	44.70	36.71	54.99
Sinkat	20.71	13.50	28.68	48.82	37.38	58.95	27.17	16.96	38.29
Haya	9.29	3.57	16.50	39.93	32.02	49.07	15.05	8.81	22.15
Dordieb	12.45	3.43	25.57	87.10	79.84	93.88	20.96	11.68	30.74
Tokar	19.22	5.49	33.41	85.24	79.45	90.16	46.80	34.70	57.21
Agig	20.47	9.65	30.96	0.43	0.00	1.52	25.91	14.55	37.35
Gabaot Elma-aadin	47.60	32.11	60.66	81.14	66.37	93.06	80.15	70.72	88.82
Halaeeb (accessible parts)	12.64	4.54	20.22	68.06	52.86	82.60	76.42	51.61	89.31
Red Sea State	28.04	17.36	38.71	57.65	47.62	67.67	47.15	37.26	57.03
Kassala Town	61.87	51.00	72.10	84.36	76.80	90.37	76.55	69.86	82.40
Refi Kassla	42.59	31.85	54.53	56.63	45.91	66.27	44.73	35.07	54.53
Rural Western Kassala	57.49	49.82	64.90	74.01	64.78	82.11	69.95	62.78	76.07
New Halfa	51.60	39.95	64.87	59.06	48.84	69.88	65.86	54.54	75.03
Refi Nahr Atbara	68.63	58.38	79.16	80.67	71.42	87.82	65.76	54.41	76.47
Rural Khashm Elgirba	57.41	52.29	62.77	92.66	86.61	97.72	60.46	51.99	68.56
Rural Wad Elhilaiw	54.98	46.51	64.25	45.09	32.52	58.39	40.54	29.83	49.47
Rural Aroma	16.04	8.49	25.50	97.48	92.46	99.57	25.00	15.45	34.81
Refi North Delta	6.22	1.61	13.79	84.68	74.50	93.02	3.43	0.86	8.89
Refi Hamashkureib	42.24	24.79	55.71	96.83	92.70	99.57	65.00	52.90	75.21
Rural Telkok	13.02	5.78	23.55	88.02	79.84	93.29	38.41	30.71	45.59
Kassala State	43.26	32.43	54.08	79.69	71.79	87.58	54.75	45.75	63.76
Gedaref Town	73.39	62.80	82.92	43.60	29.67	57.15	69.44	56.94	81.16
Middle Geddaref	63.36	53.52	74.04	32.19	22.20	45.10	61.90	48.08	73.44
Elbutana	70.27	61.51	77.76	79.50	71.31	84.85	70.67	61.30	78.50
El Fashaga	54.30	44.88	64.55	43.19	26.65	61.35	53.35	40.81	65.53
El Rahad	74.40	66.94	81.20	6.65	1.38	15.14	59.23	49.89	69.29
Gala-a El Nahal	90.74	84.02	95.15	34.74	26.09	43.37	71.79	56.15	86.62

TABLE 48: Women's consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-Rich Foods %			Calcium-Rich Foods %			Zinc-Rich Foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Fao	55.30	49.91	60.98	50.18	40.62	60.21	60.76	53.54	68.29
El Qureisha	54.82	47.15	63.10	27.88	18.49	39.17	57.66	47.78	69.66
El Mafaza	71.38	62.40	77.99	31.66	17.36	44.07	55.02	47.26	63.40
Basunda	66.24	55.98	77.53	30.77	21.45	40.40	57.57	47.13	69.22
Western Galabat	64.29	51.12	75.93	33.27	21.61	46.13	77.41	68.15	87.47
Eastern Galabat	86.68	76.71	94.31	23.81	16.34	34.03	75.82	69.93	81.00
Al-Gadarif State	69.27	60.17	78.38	34.73	23.08	46.39	63.50	53.35	73.66
Sheikan	75.75	67.89	83.60	34.26	28.01	41.51	82.40	77.22	88.23
Um Rawaba	65.34	55.81	73.17	36.34	29.84	43.47	86.45	81.21	91.08
Um Dam Haj Ahmed	74.16	65.04	82.84	29.80	22.18	37.41	89.14	80.36	94.60
El Rahad	77.72	69.80	85.47	30.15	20.60	40.10	69.77	58.16	80.35
Bara	70.75	60.68	82.89	45.21	35.58	53.29	91.97	86.85	95.46
Gharb Bara	67.74	56.86	77.99	56.41	43.23	66.57	83.30	73.03	90.65
Soudari	55.69	44.64	64.80	65.17	56.41	73.40	62.42	53.33	70.67
Gebrat El Sheikh	68.51	58.14	77.79	76.16	67.16	82.47	75.53	67.67	82.11
North Kordofan State	69.30	60.15	78.46	45.48	37.22	53.74	80.21	72.84	87.58
Kadugli	53.91	46.72	60.91	10.96	6.53	16.07	82.73	75.10	88.46
Reif Shargi	49.68	41.75	57.45	9.47	3.34	21.00	87.97	79.30	95.19
Dilling	67.83	55.94	77.30	19.67	12.74	29.42	91.48	81.07	97.19
El Quoz	68.93	61.41	77.03	23.38	18.49	30.48	76.53	68.62	84.44
Habila	52.21	41.09	62.54	24.47	17.47	33.83	76.55	67.10	85.05
Abassiya	77.91	71.08	84.80	10.89	5.45	18.86	87.91	82.32	92.50
El Rashad	53.29	41.58	66.30	24.69	14.44	35.73	80.77	69.56	89.80
Abu Jubaiha	67.91	61.80	74.67	47.45	35.15	59.57	82.45	75.43	88.45
El Tadamon	84.91	73.58	92.78	17.02	10.78	24.66	87.24	75.83	94.86
Talodi	79.29	64.65	88.12	12.77	3.62	32.59	95.77	91.67	99.30
Ghadeer	74.58	62.18	86.38	14.39	9.44	22.00	95.48	91.40	98.61
El Leri	60.59	52.71	68.35	10.17	6.37	15.15	97.31	95.02	98.96
Abu Karshola	60.00	51.25	69.01	17.92	10.53	27.00	89.44	83.78	93.35
Delami	57.03	44.84	66.42	10.20	2.65	20.02	92.74	82.58	98.41
South Kordofan State	66.72	57.59	75.86	21.75	13.51	29.98	85.96	79.16	92.76
Abu Zabad	58.67	47.55	69.31	35.83	25.17	44.92	60.16	48.66	72.17
ElKhiwai	59.29	49.68	69.23	50.52	41.73	61.92	67.57	53.79	80.43
Ghubaish	63.12	55.62	69.97	34.76	25.75	43.41	47.35	39.91	55.72
El Nuhud	56.67	49.97	64.32	42.75	34.41	51.35	35.92	29.04	42.46
El Idia	63.37	50.37	74.06	63.73	48.58	77.04	62.75	48.37	77.09
Wad Benda	50.44	38.80	59.94	43.43	35.07	52.97	54.45	43.63	64.19
Lagawa	80.77	73.14	87.69	47.58	35.12	58.41	81.90	71.74	88.61

TABLE 48: Women's consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-Rich Foods %			Calcium-Rich Foods %			Zinc-Rich Foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Elsunut	53.86	44.00	62.86	64.03	55.42	72.55	54.74	41.87	66.32
Keilik	76.92	66.56	84.83	40.38	33.49	49.02	86.99	78.88	92.05
Es Salam	70.63	65.67	75.97	48.24	41.92	53.80	51.23	43.60	58.44
Babanusa	66.00	55.48	74.58	65.54	51.18	79.87	65.43	56.82	71.75
Abyei	77.00	67.49	87.81	42.25	30.27	52.67	75.19	65.89	83.00
El Dibab	73.12	59.88	84.13	44.09	34.19	54.65	76.80	67.34	87.63
El Meiram	87.91	81.80	92.79	42.41	30.34	63.48	63.64	52.66	79.19
West Kordofan State	63.60	54.09	73.11	46.45	35.34	57.56	57.27	47.11	67.43
El Fasher	55.13	49.18	61.35	19.87	15.40	25.00	46.30	37.48	54.23
Tawila	95.29	92.62	97.85	16.63	9.38	25.84	34.13	21.72	47.51
Melit	51.55	36.97	65.93	24.75	16.73	34.60	23.72	16.17	32.33
Um Kadada	27.55	19.14	37.58	37.92	31.05	45.45	40.83	29.07	52.72
Kebkabiya	83.15	76.05	89.28	18.85	13.07	25.72	14.97	9.60	20.82
Kutum	81.70	76.27	87.30	26.86	19.12	35.10	41.10	32.07	50.74
El Mahalha	14.10	8.33	19.66	53.56	43.51	63.26	11.64	6.52	17.00
Saraf Omra	52.01	28.43	70.69	11.40	5.90	18.78	15.72	8.76	24.47
El Serief	19.59	14.63	24.24	19.66	14.95	24.49	17.10	12.36	21.14
Dar Elsalam	50.59	42.26	58.86	10.38	4.99	16.59	51.34	39.49	62.42
Kelemando	80.47	74.38	86.01	31.44	21.71	41.31	63.81	55.56	72.34
El Tawisha	34.68	25.29	45.27	35.01	28.79	41.90	35.80	27.20	44.83
Um Baru	90.96	75.38	97.52	64.97	53.27	78.71	43.69	28.43	55.34
El Lait	66.38	58.29	73.69	13.18	8.42	18.64	57.70	49.99	65.03
ELkuma	63.41	48.82	73.89	51.46	38.50	64.45	55.38	36.36	65.90
El Tina	55.56	22.22	88.89	11.11	0.00	33.33	11.11	0.00	33.33
Kernoi	49.38	43.26	54.60	67.37	59.70	75.01	34.86	29.61	39.37
North Darfur State	55.21	43.42	67.00	27.50	17.73	37.27	33.75	24.40	43.09
Nyala South	51.10	45.74	57.22	33.99	25.64	44.29	49.85	43.97	57.21
Nyala North	67.83	27.81	88.25	46.48	15.78	79.14	66.67	32.35	85.45
Es Salam	88.26	84.98	91.94	31.94	26.87	37.48	71.86	66.01	78.06
El Wihda	60.12	46.72	71.49	16.01	10.52	22.92	31.61	23.60	42.35
Mershing	85.92	80.80	91.72	30.73	18.15	41.94	57.94	50.07	64.24
Beliel	59.98	54.95	65.53	11.46	6.91	17.24	63.88	58.26	69.58
Nitega	58.84	49.50	68.29	46.90	36.56	56.46	42.53	30.64	54.78
Sharg El Jabal (accessible parts)	66.67	40.00	86.67	0.00	0.00	0.00	33.33	6.67	60.00
Kas	77.70	70.38	84.62	42.93	34.80	51.24	73.46	66.36	80.10
Shattaya	92.68	87.91	96.71	45.15	30.24	62.75	93.95	90.65	96.71
Buram	90.35	86.40	94.34	52.89	41.84	63.29	94.59	91.66	97.53
Gereida	93.36	87.46	98.20	51.67	36.41	65.64	89.86	81.36	95.41

TABLE 48: Women's consumption of iron-, calcium- and zinc-rich foods by locality and by state

Location	Iron-Rich Foods %			Calcium-Rich Foods %			Zinc-Rich Foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Sunta	81.25	75.91	86.08	61.93	52.97	70.74	95.17	92.32	97.75
El Radoum	93.04	89.26	96.75	58.49	47.25	67.72	90.69	84.06	96.27
Tulus	79.47	68.50	92.88	73.06	63.06	82.76	60.15	46.43	78.26
Damso	93.01	86.74	96.60	44.75	27.52	64.43	75.61	65.98	84.54
Ed Elfursan	91.13	81.88	97.26	60.44	48.83	68.98	39.39	33.44	46.49
Kubum	87.62	83.82	90.80	38.34	32.02	45.17	54.38	49.01	59.69
Kateila	78.52	65.20	92.53	25.11	17.87	32.86	40.82	34.35	46.66
Rehaid Elbirdi	95.36	92.68	97.69	54.71	44.51	64.92	68.57	58.40	78.14
Um Dafoug	95.04	91.93	97.48	59.90	51.61	67.84	60.35	47.76	72.55
South Darfur State	79.46	69.15	89.77	47.12	33.19	61.05	64.89	54.18	75.60
Abu Jabra	33.26	23.26	42.86	32.90	25.22	40.61	21.72	14.37	30.61
Abu Karinka	25.12	19.27	30.78	14.22	8.74	20.27	31.45	25.89	36.63
Bahr El Arab	19.05	13.87	25.16	0.00	0.00	0.00	14.11	9.49	19.44
Adila	9.08	4.64	14.78	36.02	29.18	44.16	8.52	5.66	13.23
Ed Dain	69.57	56.87	78.30	31.44	23.35	40.78	78.87	67.59	88.14
Assalaya	11.19	3.31	21.11	35.09	23.48	46.61	7.39	1.91	14.40
El Firdous	73.03	63.22	82.50	64.07	52.58	73.91	24.09	17.15	30.34
Shia-ria	67.96	52.59	80.70	61.74	49.64	73.58	68.09	54.45	80.45
Yassin	28.15	20.61	35.11	11.40	6.02	17.88	26.87	18.07	36.05
East Darfur State	33.35	24.82	41.88	28.42	20.40	36.44	28.53	20.73	36.33
El Geneina	80.35	73.50	87.62	53.11	40.69	64.29	79.45	69.34	87.33
Habila	47.04	38.67	55.27	39.41	26.35	53.39	45.82	37.23	57.11
Kulbus	77.49	64.98	89.75	37.34	26.74	47.02	78.22	66.02	91.47
Beida	79.97	74.15	86.07	80.30	66.71	89.67	76.15	66.88	83.48
Foro Baranga	69.63	59.57	78.60	25.49	17.52	33.71	60.32	51.15	69.01
Kereneik	78.12	72.90	82.36	13.08	9.33	17.22	76.49	72.23	80.34
Sirba	70.64	57.19	82.10	12.82	5.62	21.41	67.87	54.89	78.29
Jebel Moon	54.45	44.75	63.02	30.30	18.12	45.06	58.98	47.63	70.91
West Darfur State	72.61	63.62	81.61	38.51	27.73	49.30	71.30	60.89	81.70
Zalingi	39.46	29.22	50.09	19.64	12.30	27.16	38.94	27.96	49.05
Wadi Salih	90.61	80.49	97.41	29.61	18.36	42.88	90.46	82.90	96.76
Mukjar	65.12	51.51	77.39	53.33	42.00	66.39	88.25	79.87	95.55
Central Jebel Mara	66.21	53.77	78.09	0.00	0.00	0.00	68.57	57.96	79.45
North Jebel Mara	88.28	78.66	95.81	0.70	0.00	4.26	88.59	79.57	95.60
Bendasi	84.05	68.80	96.71	29.18	19.59	40.65	69.06	58.71	79.36
Nertiti	87.64	82.61	91.95	20.85	10.57	31.31	86.52	81.52	91.17
Azum	86.08	78.28	92.87	44.85	30.09	61.16	85.60	76.97	92.74
Um Dukhun	65.12	58.23	72.35	25.51	10.47	42.53	92.13	85.55	97.57
Central Darfur State	72.96	62.72	83.19	24.31	13.03	35.60	77.54	68.82	86.27

Spatial distribution of consumption of iron-, calcium- and zinc-rich foods

There was a near-even spatial spread of moderate to high consumption of iron-rich foods, with areas of low consumption in Red Sea, Kassala and parts of North and East Darfur states *(see Figure 184)*. There was a decreasing spatial trend of calcium-rich foods consumption from the east to the west of the country: areas of Red Sea and Kassala state had the highest consumption, and this decreased with a move on the map toward the Darfur states and the southern parts of Sudan *(see Figure 186)*. Zinc-rich food consumption followed a similar spatial pattern as iron-rich food consumption *(see Figure 188)*.

FIGURE 184:
Consumes iron-rich foods (raster)

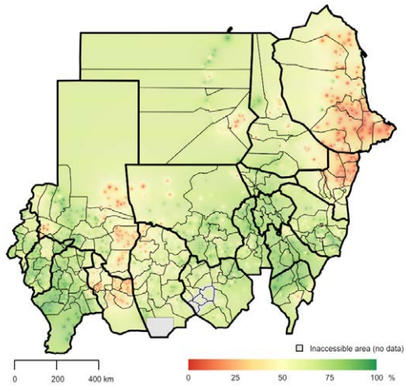


FIGURE 185:
Consumes iron-rich foods

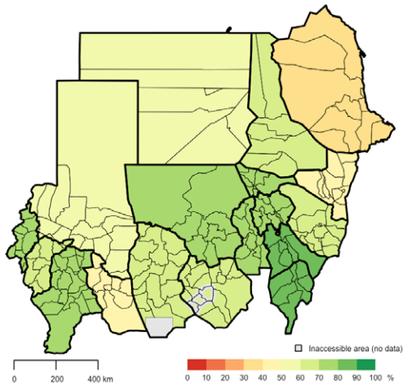


FIGURE 186:
Consumes calcium-rich foods (raster)

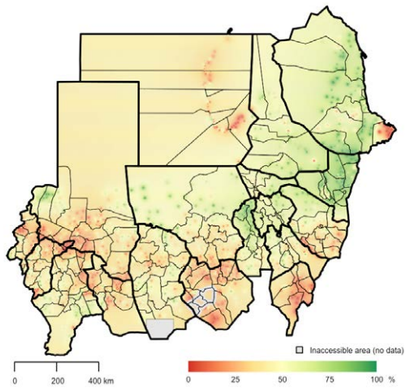
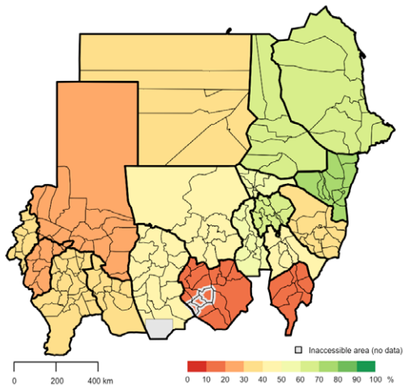


FIGURE 187:
Consumes calcium-rich foods



3.7.5 Women's consumption of vitamin B-rich foods[45]

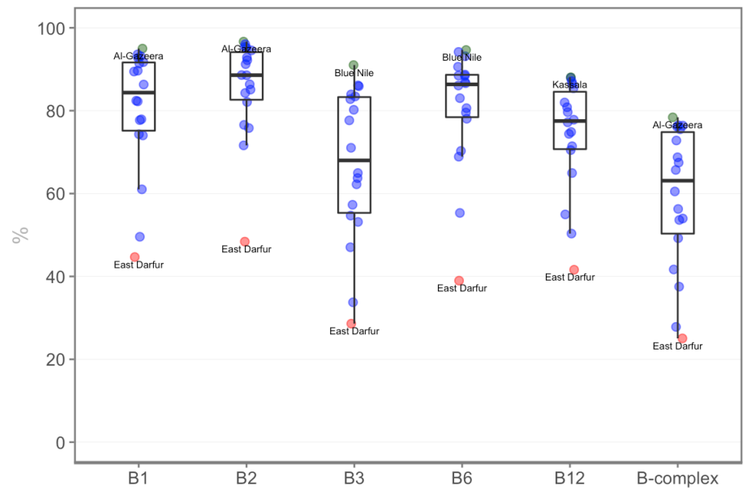
Women's consumption of vitamin B-rich foods

Vitamin B-rich foods consumption was generally high among women interviewed, with 62.1 per cent (95 per cent CI: 53.1-71.1 per cent) consuming vitamin B-rich foods.

There was considerable variance among states; specifically, 33.3 per cent of states had more than 70 per cent of women who consumed vitamin B-rich foods. Al-Gazeera state had the highest proportion of vitamin B-rich foods consumption, while East Darfur state had the lowest *(see Figure 190)*.

Across localities, there was also high inter-locality variance; specifically, 35.1 per cent of localities had more than 70 per cent of women who consumed vitamin B-rich foods. El Tadamon locality in Blue Nile state had the highest proportion of Vitamin B-rich foods consumption, while Refi North Delta locality from Kassala state had the lowest proportion *(see Figure 191)*. Table 49, Table 50, Table 51 and Table 52 present results by state, by locality and at the national level for proportion of vitamin B-rich foods consumption.

FIGURE 190: Box plot of state results for carers' consumption of foods rich In vitamin B



[45] Including vitamin B1, B2, B3, B6 and B12.

FIGURE 191: Box plot of locality results for carers' consumption of foods rich in vitamin B

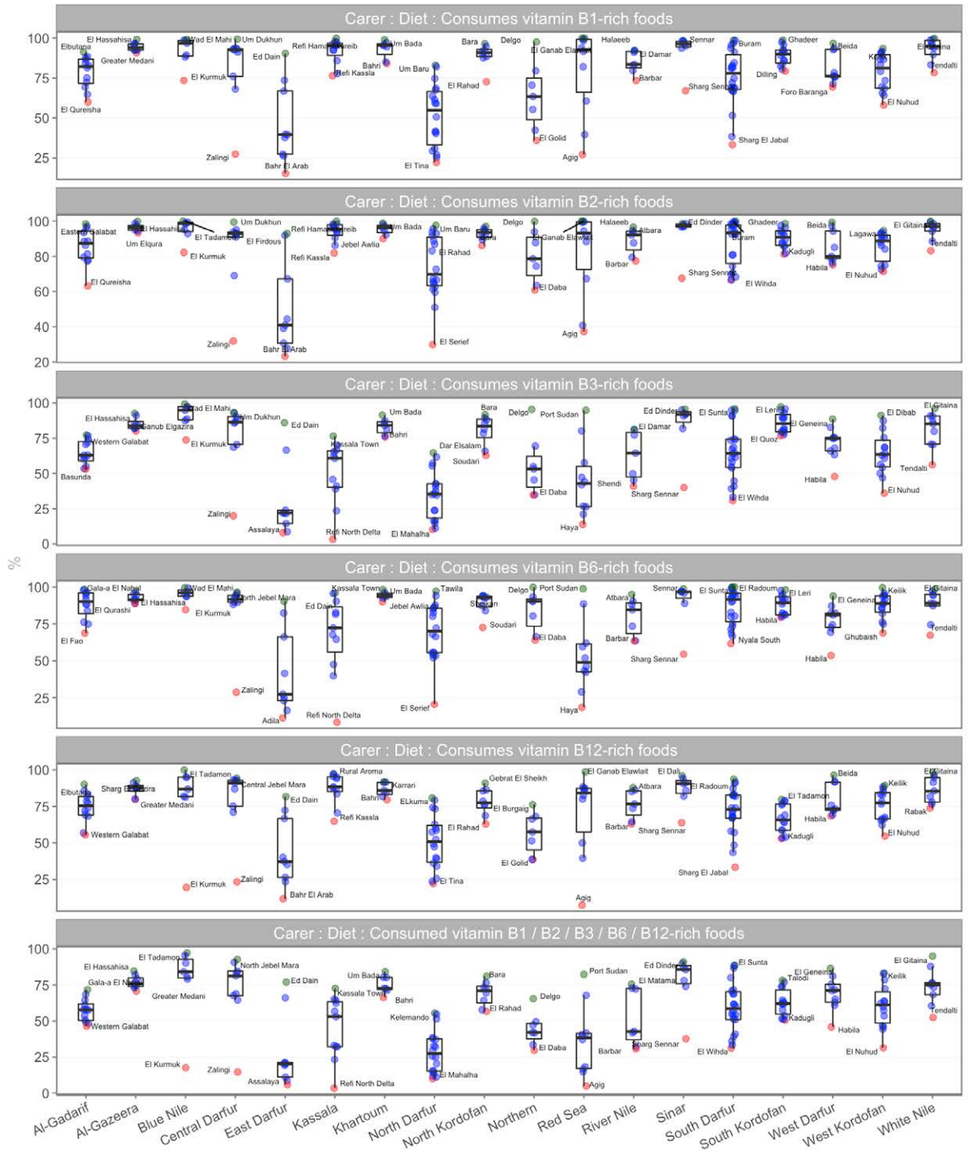


TABLE 49: Women's consumption of vitamin B-rich foods by state and national

State	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	77.72	67.14	88.31	85.09	77.45	92.73	63.74	53.35	74.12
Al-Gazeera	94.99	90.72	99.25	96.67	92.72	99.99	86.10	79.70	92.50
Blue Nile	91.72	85.19	98.24	95.42	90.78	99.99	91.01	84.41	97.61
Central Darfur	82.24	74.23	90.25	84.27	75.92	92.63	77.66	69.42	85.91
East Darfur	44.68	34.95	54.41	48.40	38.24	58.56	28.60	20.74	36.45
Kassala	92.74	88.45	97.03	94.56	90.70	98.41	54.68	45.70	63.67
Khartoum	93.15	88.87	97.43	95.21	92.16	98.27	83.92	77.93	89.92
North Darfur	49.57	38.97	60.16	71.62	60.33	82.91	33.75	23.71	43.79
North Kordofan	89.44	84.33	94.56	92.86	88.56	97.16	80.22	72.66	87.78
Northern	61.02	46.52	75.52	75.81	67.11	84.51	53.16	39.30	67.02
Red Sea	74.03	66.97	81.10	76.57	69.04	84.10	47.04	36.76	57.32
River Nile	86.31	80.11	92.50	88.55	83.18	93.92	62.23	53.16	71.30
Sennar	91.40	85.16	97.64	92.19	86.54	97.85	82.79	75.71	89.87
South Darfur	77.93	68.28	87.58	88.60	78.95	98.26	64.96	54.10	75.81
South Kordofan	89.65	83.45	95.85	91.23	84.97	97.49	85.91	78.79	93.04
West Darfur	82.42	75.50	89.34	86.36	79.72	93.00	71.04	61.09	80.99
West Kordofan	74.32	65.79	82.84	82.10	75.03	89.16	57.29	47.26	67.31
White Nile	93.58	89.95	97.21	96.05	93.00	99.10	83.45	78.02	88.88
Sudan	82.83	75.62	90.03	88.01	81.46	94.56	69.73	61.33	78.14

TABLE 50: Women's consumption of vitamin B-rich foods by state and national (continuation)

State	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	86.63	79.69	93.57	74.40	64.18	84.61	56.28	44.80	67.75
Al-Gazeera	93.14	87.96	98.32	87.94	81.63	94.26	78.40	70.56	86.23
Blue Nile	94.65	90.15	99.16	77.82	69.19	86.44	75.51	66.93	84.09
Central Darfur	86.91	79.57	94.25	81.98	73.60	90.37	72.81	63.40	82.22
East Darfur	38.98	30.37	47.58	41.61	32.22	51.01	25.05	17.67	32.44
Kassala	70.29	61.09	79.50	88.07	81.91	94.23	49.23	40.57	57.88
Khartoum	94.18	90.50	97.86	87.12	81.00	93.24	76.38	68.70	84.07
North Darfur	68.90	57.17	80.63	50.34	39.13	61.55	27.82	17.84	37.81
North Kordofan	88.72	82.82	94.63	77.20	70.36	84.04	67.47	59.54	75.39
Northern	80.61	72.08	89.14	54.97	41.65	68.28	41.68	28.97	54.39

TABLE 50: Women's consumption of vitamin B-rich foods by state and national (continuation)

State	Vitamin B1-rich foods %			Vitamin B2-rich foods %			Vitamin B3-rich foods %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Red Sea	55.32	43.80	66.85	64.95	56.18	73.72	37.53	27.71	47.35
River Nile	79.55	72.20	86.91	79.65	73.14	86.15	53.98	45.43	62.53
Sennar	88.48	82.58	94.37	85.42	78.18	92.65	76.47	68.95	83.99
South Darfur	86.07	76.65	95.48	74.86	65.27	84.45	60.51	49.01	72.01
South Kordofan	88.41	81.53	95.29	70.49	62.02	78.95	65.70	56.31	75.10
West Darfur	78.06	68.48	87.64	80.83	74.39	87.27	68.76	58.77	78.74
West Kordofan	83.02	75.99	90.04	71.43	62.81	80.05	53.62	43.57	63.67
White Nile	90.60	86.16	95.04	86.50	81.48	91.51	76.16	70.17	82.15
Sudan	83.42	76.06	90.79	76.90	68.90	84.91	62.13	53.13	71.13

TABLE 51: Maternal consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B1-Rich foods			Vitamin B2-Rich foods			Vitamin B3-Rich foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	60.76	49.14	72.06	86.54	78.91	91.94	51.33	42.37	64.32
El Golid	37.45	14.73	57.68	64.46	50.52	76.59	36.38	14.22	59.23
Merwoe	69.68	60.84	79.58	73.33	63.45	83.70	68.59	58.59	77.82
El Daba	41.20	23.89	58.87	60.80	54.10	68.30	34.73	18.34	49.90
Halfa	69.86	60.03	79.32	94.89	92.62	97.05	55.07	44.00	66.15
Delgo	98.37	96.55	99.59	100.00	99.14	100.00	97.19	94.19	99.38
El Burgaig	80.97	73.43	88.10	80.21	72.51	87.68	56.34	47.54	64.92
Northern State	61.02	46.52	75.52	75.81	67.11	84.51	53.16	39.30	67.02
El Matama	89.47	83.81	93.97	93.07	87.95	96.70	80.09	73.70	85.41
Shendi	82.82	76.70	88.51	87.63	82.59	92.37	41.34	30.73	51.78
Abu Hamad	76.25	69.23	83.26	77.17	69.57	84.33	44.86	34.26	53.91
Barbar	75.00	65.40	84.31	79.13	71.42	86.71	47.06	33.89	58.08
El Damar	93.78	90.17	96.72	93.12	89.67	95.85	80.26	73.60	85.64
Atbara	96.31	91.09	98.69	96.25	91.34	98.49	82.24	75.89	87.99
El Buhaira	81.77	77.28	86.32	91.78	89.36	94.51	63.72	57.69	69.75
River Nile State	86.31	80.11	92.50	88.55	83.18	93.92	62.23	53.16	71.30
Khartoum	97.02	93.89	98.82	97.94	96.09	99.03	87.45	82.57	91.31
Bahri	85.14	78.88	90.18	92.89	87.91	96.69	76.42	70.04	82.56
Um Durman	94.33	89.75	97.68	96.34	91.92	98.92	85.93	77.66	92.54
Um Bada	99.05	95.45	100.00	99.05	96.41	100.00	93.12	86.40	96.57

TABLE 51: Maternal consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B1-Rich foods			Vitamin B2-Rich foods			Vitamin B3-Rich foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Jebel Awlia	84.99	79.76	89.80	89.59	85.68	93.10	77.02	71.09	82.59
Sharg Elneel	95.35	92.53	97.69	96.84	94.73	98.66	81.45	75.72	86.77
Karrari	95.47	90.44	98.26	94.00	88.83	97.90	84.92	77.71	90.90
Khartoum State	93.15	88.87	97.43	95.21	92.16	98.27	83.92	77.93	89.92
Greater Medani	91.53	87.20	94.84	95.12	92.58	97.45	83.39	78.27	88.20
Ganub Elgazira	90.91	86.35	94.74	93.59	90.12	96.97	79.17	73.54	84.41
El Hassahisa	98.84	97.15	99.81	99.62	98.67	100.00	90.11	85.33	94.70
El Kamlin	96.86	93.86	98.96	98.76	97.31	99.79	82.79	77.11	88.39
Sharg El Gezira	96.43	91.48	99.61	96.95	91.46	99.61	85.51	78.13	91.86
Um Elqura	95.80	92.67	98.29	96.79	93.60	98.94	84.04	79.03	89.01
El Manaqil	96.09	92.51	98.83	97.41	94.80	99.03	91.85	87.35	95.60
El Qurashi	92.32	82.65	98.21	93.81	86.04	98.91	83.71	70.64	91.69
Al-Gazeera State	94.99	90.72	99.25	96.67	92.72	99.99	86.10	79.70	92.50
Sennar	98.34	97.10	99.30	98.58	97.32	99.52	94.92	92.40	97.08
Sharg Sennar	65.72	53.12	77.31	66.49	52.04	80.67	39.44	28.26	52.40
Sinja	96.32	92.45	98.88	96.73	93.21	99.01	92.14	87.26	95.49
Abu Hujar	93.49	89.61	97.06	96.48	93.84	98.58	84.27	75.34	90.38
El Dali	97.33	94.47	99.24	97.71	95.05	99.45	90.94	85.71	95.06
Es Suki	95.96	91.01	99.20	97.58	94.65	99.40	91.11	86.35	94.98
Ed Dinder	98.66	96.91	99.78	99.07	97.37	100.00	95.13	86.54	99.10
Sennar State	91.40	85.16	97.64	92.19	86.54	97.85	82.79	75.71	89.87
Ed Damazine	95.14	91.87	97.66	98.45	96.99	99.48	93.89	89.11	96.91
El Tadamon	98.76	97.01	99.75	100.00	100.00	100.00	97.53	95.58	99.01
El Roseiris	90.00	84.94	94.29	95.36	92.22	97.75	88.81	83.88	92.95
Baw	97.64	91.44	100.00	98.21	93.17	100.00	96.11	89.82	100.00
Geisan	87.83	81.74	93.78	92.63	84.97	97.39	87.04	79.09	92.69
El Kurmuk	73.36	57.69	86.24	82.61	71.82	91.91	72.83	56.47	86.26
Wad El Mahi	98.19	94.44	100.00	98.63	95.46	100.00	98.26	94.00	100.00
Blue Nile State	91.72	85.19	98.24	95.42	90.78	99.99	91.01	84.41	97.61
Kosti	90.31	86.80	93.74	96.97	94.99	98.51	87.18	83.38	91.11
Guli	95.08	91.68	97.73	95.24	91.87	97.72	74.14	67.43	81.80
Tendalti	79.76	72.73	86.49	83.26	76.49	88.85	55.49	48.44	63.04
Es Salam	96.44	93.40	99.00	98.04	95.79	99.41	89.98	82.23	95.88
Rabak	89.11	82.52	94.62	92.06	87.59	96.25	76.46	68.81	83.48
El Jabalain	94.08	90.49	96.75	96.25	93.30	98.49	84.42	79.61	88.96
El Diwaim	99.22	97.80	100.00	99.60	97.96	100.00	90.00	87.01	93.23
Um Rimta	98.69	97.26	99.78	98.73	97.21	99.78	80.04	74.95	85.41
El Gitaina	99.80	98.97	100.00	99.80	98.97	100.00	96.29	91.85	99.19

TABLE 51: Maternal consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B1-Rich foods			Vitamin B2-Rich foods			Vitamin B3-Rich foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
White Nile State	93.58	89.95	97.21	96.05	93.00	99.10	83.45	78.02	88.88
Port Sudan	97.50	95.08	99.12	99.12	97.55	100.00	93.65	89.87	97.07
Swakin	77.33	69.81	85.38	82.75	76.48	88.67	37.95	29.31	47.03
El Gonob Welawlaib	100.00	100.00	100.00	100.00	100.00	100.00	45.93	36.11	56.86
Sinkat	60.57	47.27	73.02	68.37	55.01	81.02	28.10	17.31	39.40
Haya	40.44	32.33	49.82	41.97	32.48	52.39	14.95	7.72	22.53
Dordieb	92.07	84.86	96.43	92.63	84.86	96.82	20.79	10.85	30.81
Tokar	94.30	90.98	96.95	95.23	91.59	98.19	47.51	34.12	58.93
Agig	25.64	14.30	37.48	35.87	25.64	44.55	25.00	13.97	37.32
Gabaot Elma-aadin	99.63	98.32	100.00	99.67	98.29	100.00	80.61	71.07	87.71
Halaeeb (accessible parts)	97.40	88.29	100.00	97.17	89.55	100.00	76.40	54.53	90.55
Red Sea State	74.03	66.97	81.10	76.57	69.04	84.10	47.04	36.76	57.32
Kassala Town	95.07	91.65	97.80	95.46	92.00	98.21	76.46	69.93	82.19
Refi Kassla	78.21	68.93	84.78	82.78	74.26	89.38	45.02	35.87	54.70
Rural Western Kassala	93.09	90.36	95.64	93.81	91.12	96.04	69.93	62.37	75.81
New Halfa	91.99	87.63	95.61	94.22	89.71	97.39	65.48	55.20	74.81
Refi Nahr Atbara	96.43	93.25	98.74	98.32	95.58	99.79	65.89	53.57	75.63
Rural Khashm Elgirba	97.92	94.76	100.00	98.12	95.22	100.00	60.75	52.62	70.69
Rural Wad Elhilaiw	72.17	63.63	80.57	88.41	83.93	92.88	40.47	31.29	48.80
Rural Aroma	98.32	95.31	99.79	98.41	95.44	99.79	25.28	16.36	34.19
Refi North Delta	85.41	74.81	94.26	85.82	75.78	93.35	3.60	0.69	9.39
Refi Hamashkureib	100.00	99.36	100.00	100.00	99.58	100.00	64.22	52.42	74.34
Rural Telkok	95.59	91.99	97.87	96.22	93.41	98.11	38.41	30.18	45.95
Kassala State	92.74	88.45	97.03	94.56	90.70	98.41	54.68	45.70	63.67
Gedaref Town	77.74	67.51	87.94	85.91	75.22	92.87	68.41	55.80	80.22
Middle Geddaref	75.11	60.97	86.98	81.29	72.33	89.49	61.36	46.76	72.94
Elbutana	90.99	84.55	95.66	93.32	86.64	97.85	70.55	61.36	77.42
El Fashaga	71.90	55.95	87.21	76.38	64.60	87.99	53.54	41.66	66.80
El Rahad	62.22	52.05	72.42	77.35	69.25	84.62	58.69	50.70	68.84
Gala-a El Nahal	81.12	65.96	93.02	94.63	89.43	98.63	71.26	51.15	86.23
El Fao	88.05	79.07	95.09	87.06	78.96	94.56	60.36	53.52	68.02
El Qureisha	63.32	51.93	74.67	65.56	53.75	75.98	57.69	48.33	68.07
El Mafaza	79.81	70.82	88.20	86.15	81.37	91.12	55.58	46.93	62.84
Basunda	72.10	59.99	82.20	81.57	74.57	89.17	57.70	47.37	69.30
Western Galabat	86.73	79.67	93.52	97.24	94.00	99.80	77.58	68.27	87.39
Eastern Galabat	87.00	80.69	92.31	97.72	95.28	99.63	75.68	70.63	81.01

TABLE 51: Maternal consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B1-Rich foods			Vitamin B2-Rich foods			Vitamin B3-Rich foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif State	77.72	67.14	88.31	85.09	77.45	92.73	63.74	53.35	74.12
Sheikan	86.72	82.28	91.24	91.23	87.16	94.97	82.25	77.14	87.41
Um Rawaba	91.18	87.45	94.77	94.04	90.80	96.88	86.34	80.97	91.16
Um Dam Haj Ahmed	91.65	84.26	96.39	94.13	86.35	98.38	88.96	81.11	94.63
El Rahad	77.30	67.07	86.78	91.12	84.68	96.26	69.55	54.75	79.91
Bara	96.45	93.21	98.54	97.37	94.29	99.37	92.12	86.97	95.75
Gharb Bara	89.90	81.73	96.64	92.18	82.66	98.11	82.73	72.20	90.99
Soudari	90.68	87.08	93.77	91.82	88.31	94.47	62.00	52.54	70.09
Gebrat El Sheikh	93.01	89.96	95.83	94.49	91.30	97.02	75.41	65.64	83.65
North Kordofan State	89.44	84.33	94.56	92.86	88.56	97.16	80.22	72.66	87.78
Kadugli	84.58	76.79	90.00	84.98	78.03	90.51	82.58	76.15	88.31
Reif Shargi	91.04	82.97	96.44	91.08	83.98	96.71	87.97	78.88	95.38
Dilling	93.99	82.29	97.52	97.62	86.69	99.61	91.47	81.39	96.44
El Quoz	81.98	74.11	88.67	85.19	78.25	91.06	76.79	68.35	84.91
Habila	82.26	73.94	90.28	82.72	73.83	90.18	76.26	65.95	85.53
Abassiya	90.14	85.38	94.37	92.40	86.84	96.83	88.07	82.55	92.90
El Rashad	86.19	76.99	92.71	87.89	78.71	94.66	80.41	71.60	89.98
Abu Jubaiha	91.46	84.41	96.83	91.41	84.67	96.61	82.55	75.61	88.55
El Tadamon	89.30	81.02	95.97	92.76	83.87	98.09	86.83	76.74	94.95
Talodi	96.43	92.19	99.30	96.43	92.25	100.00	95.74	91.42	99.29
Ghadeer	98.61	95.96	100.00	98.64	96.17	100.00	95.44	91.39	98.51
El Leri	97.51	95.41	98.98	97.54	95.85	98.97	97.30	94.97	98.97
Abu Karshola	90.53	85.94	94.26	91.86	87.27	95.57	89.08	84.02	93.28
Delami	92.94	85.22	99.18	94.53	87.79	99.21	93.16	84.58	98.37
South Kordofan State	89.65	83.45	95.85	91.23	84.97	97.49	85.91	78.79	93.04
Abu Zabad	71.49	61.99	80.52	74.46	65.21	82.85	60.31	48.22	73.69
ElKhiwai	84.26	74.73	90.70	84.73	76.28	91.40	67.92	55.05	79.21
Ghubaish	62.83	54.11	70.58	73.80	66.59	80.74	47.47	40.01	55.61
El Nuhud	59.39	51.34	66.90	74.24	68.83	78.96	35.65	28.99	42.47
El Idia	78.96	67.23	89.35	85.97	75.38	94.29	62.08	49.48	73.89
Wad Benda	74.69	63.16	83.46	76.39	65.51	85.12	54.62	43.60	63.40
Lagawa	90.66	84.02	95.60	94.67	90.59	97.64	81.73	70.54	88.53
Elsunut	87.75	78.85	93.72	88.58	80.79	94.50	54.80	42.44	66.10
Keilik	93.58	88.02	96.26	93.92	89.02	96.39	86.82	77.83	92.03
Es Salam	70.49	62.52	77.31	88.41	84.87	91.82	51.27	43.98	59.26
Babanusa	86.53	80.32	91.83	89.76	84.65	94.37	65.08	57.62	72.11

TABLE 51: Maternal consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B1-Rich foods			Vitamin B2-Rich foods			Vitamin B3-Rich foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abyei	86.75	82.96	90.13	92.29	87.77	96.54	75.72	66.33	83.08
El Dibab	84.54	76.59	92.19	88.30	80.75	94.85	77.01	66.31	88.61
El Meiram	66.83	55.06	81.47	89.23	83.62	94.45	63.32	52.97	77.93
West Kordofan State	74.32	65.79	82.84	82.10	75.03	89.16	57.29	47.26	67.31
El Fasher	52.66	44.72	60.01	66.67	59.32	73.93	45.99	38.30	54.52
Tawila	40.91	28.62	53.36	95.90	93.19	98.20	33.97	24.14	47.08
Melit	39.32	29.88	49.71	63.58	52.39	74.90	23.83	16.91	31.54
Um Kadada	63.89	53.13	73.69	64.38	55.27	74.03	41.20	29.77	52.88
Kebkabiya	31.78	24.43	39.96	93.03	88.76	96.55	15.32	10.12	20.55
Kutum	48.39	37.44	58.92	90.49	85.82	94.68	40.92	32.04	49.45
El Mahalha	56.36	46.01	65.38	58.59	47.76	69.09	11.50	6.76	17.28
Saraf Omra	26.24	17.46	34.41	59.48	39.20	78.81	15.28	7.98	23.87
El Serief	27.51	21.91	33.90	30.02	24.37	35.58	17.01	12.92	21.16
Dar Elsalam	53.90	40.03	66.99	81.22	68.50	90.49	51.00	36.62	62.76
Kelemando	71.73	62.98	80.21	87.67	82.21	93.26	64.60	54.44	72.00
El Tawisha	60.70	53.11	68.59	62.93	55.13	70.53	35.74	26.25	45.05
Um Baru	82.83	72.51	90.97	100.00	90.63	100.00	44.40	30.46	56.23
El Lait	59.51	51.09	67.60	68.76	60.97	76.45	57.58	49.67	66.45
ELkuma	82.55	70.87	88.97	89.31	78.56	94.80	55.46	36.95	67.28
El Tina	22.22	0.00	55.56	66.67	33.33	88.89	11.11	0.00	33.33
Kernoi	79.67	73.89	85.21	86.58	82.50	90.29	34.51	29.58	39.62
North Darfur State	49.57	38.97	60.16	71.62	60.33	82.91	33.75	23.71	43.79
Nyala South	59.38	51.76	68.69	62.31	55.47	71.34	50.00	44.34	57.11
Nyala North	75.22	38.22	93.93	76.74	41.73	97.09	64.84	29.40	85.01
Es Salam	79.97	75.55	84.94	92.91	90.56	95.22	71.89	65.40	77.85
El Wihda	39.02	29.64	50.16	65.22	54.48	75.08	31.69	23.12	41.84
Mershing	69.43	58.48	77.95	93.54	90.09	96.22	57.60	50.08	65.58
Beliel	66.86	59.55	73.83	69.00	62.57	75.06	63.63	56.87	70.14
Nitega	69.00	59.56	78.10	81.33	75.44	86.30	42.97	30.53	54.21
Sharg El Jabal (accessible parts)	33.33	13.33	60.00	66.67	46.33	87.00	33.33	13.33	60.00
Kas	80.85	76.17	86.15	92.53	88.49	96.17	73.37	66.36	80.07
Shattaya	96.87	94.25	98.88	98.91	97.58	100.00	93.99	91.14	96.62
Buram	98.68	96.77	99.84	100.00	100.00	100.00	94.80	91.49	97.77
Gereida	93.75	85.26	98.22	99.61	98.30	100.00	90.26	80.76	96.25
El Sunta	98.58	96.34	100.00	99.43	97.18	100.00	95.17	92.17	97.48
El Radoum	95.79	91.97	98.54	98.17	96.00	99.46	90.84	84.89	95.64

TABLE 51: Maternal consumption of vitamin B-rich foods by locality and by state

Location	Vitamin B1-Rich foods			Vitamin B2-Rich foods			Vitamin B3-Rich foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Tulus	91.01	86.12	96.88	98.59	93.34	100.00	58.82	46.03	77.88
Damso	86.30	79.86	93.07	97.93	95.22	99.65	76.74	63.92	85.88
Ed Elfursan	67.82	58.98	74.46	95.31	87.78	99.56	39.59	33.70	46.35
Kubum	71.94	66.51	77.20	93.02	90.22	95.23	54.85	48.76	59.45
Kateila	52.61	43.94	59.66	79.67	66.34	91.84	41.11	33.80	47.66
Rehaid Elbirdi	83.60	76.31	89.62	97.40	95.57	99.01	69.19	60.30	78.48
Um Dafoug	81.46	74.69	87.44	97.50	95.04	99.25	60.30	49.10	72.31
South Darfur State	77.93	68.28	87.58	88.60	78.95	98.26	64.96	54.10	75.81
Abu Jabra	39.78	31.20	51.19	45.08	35.99	56.26	22.30	13.55	32.98
Abu Karinka	36.99	29.64	43.94	38.63	31.04	45.69	31.63	25.77	38.17
Bahr El Arab	15.19	10.41	20.88	22.81	17.55	28.22	14.11	9.20	19.51
Adila	39.83	31.54	48.07	40.71	31.97	50.79	8.78	5.66	13.32
Ed Dain	85.05	73.67	93.65	85.84	73.52	93.52	78.92	67.45	88.14
Assalaya	37.48	24.76	52.75	38.46	25.86	52.99	6.95	1.41	15.30
El Firdous	74.54	66.04	83.15	87.87	80.31	93.62	23.60	16.85	30.70
Shia-ria	68.12	53.51	81.85	67.95	53.96	82.25	67.44	55.52	80.51
Yassin	33.76	22.98	42.86	36.92	26.53	47.10	26.19	17.57	36.05
East Darfur State	44.68	34.95	54.41	48.40	38.24	58.56	28.60	20.74	36.45
El Geneina	86.92	79.60	94.33	92.29	83.72	97.00	79.61	69.63	88.18
Habila	65.64	55.59	76.12	69.54	58.13	80.79	45.66	37.48	55.62
Kulbus	92.41	88.04	95.78	93.46	89.05	96.59	78.32	63.92	90.76
Beida	96.46	90.85	99.52	99.34	98.31	100.00	75.40	66.99	84.25
Foro Baranga	68.04	59.99	76.77	78.53	69.35	85.10	60.81	51.23	69.37
Kereneik	77.27	72.85	81.65	81.68	76.55	86.26	76.38	71.98	80.78
Sirba	77.70	70.05	83.88	82.21	73.50	88.07	68.47	55.45	79.75
Jebel Moon	78.54	70.34	85.75	79.29	71.08	86.36	59.58	47.60	71.50
West Darfur State	82.42	75.50	89.34	86.36	79.72	93.00	71.04	61.09	80.99
Zalingi	50.73	40.58	59.60	54.59	42.66	64.42	38.45	29.09	48.64
Wadi Salih	91.28	82.96	97.23	92.56	83.15	97.96	90.35	83.46	96.82
Mukjar	93.64	86.64	98.61	93.79	87.35	98.71	88.46	79.22	95.80
Central Jebel Mara	68.35	57.55	79.30	69.06	58.20	81.65	68.57	57.14	78.53
North Jebel Mara	88.51	79.55	95.69	89.12	80.40	95.95	89.44	80.28	95.89
Bendasi	75.08	67.21	82.30	88.74	77.51	97.70	68.98	55.63	77.65
Nertiti	93.91	90.31	96.52	95.15	92.31	97.45	86.36	81.80	90.83
Azum	93.06	85.71	98.47	93.94	87.63	98.19	86.29	79.47	93.59
Um Dukhun	99.44	98.32	100.00	99.44	98.27	100.00	92.16	85.07	97.67
Central Darfur State	82.24	74.23	90.25	84.27	75.92	92.63	77.66	69.42	85.91
Sudan	82.83	75.62	90.03	88.01	81.46	94.56	69.73	61.33	78.14

TABLE 52: Women's consumption of vitamin B-rich foods by locality and by state (continuation)

Location	Vitamin B6-Rich foods			Vitamin B12-Rich foods			Consumed Vitamin B1 / Carer: B2 / B3 / B6 / B12-Rich Foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	91.15	85.01	95.51	66.37	55.49	75.40	46.14	36.45	54.57
El Golid	66.40	54.64	79.55	38.54	17.83	60.66	33.27	13.64	55.25
Merwoe	78.96	65.85	91.70	50.32	36.98	61.10	40.43	29.89	48.96
El Daba	63.72	56.35	70.17	37.73	22.11	52.69	29.01	14.64	42.16
Halfa	93.91	91.06	96.23	64.22	57.64	70.89	44.67	36.91	52.16
Delgo	99.79	98.79	100.00	69.92	63.25	76.62	68.18	61.09	75.27
El Burgaig	91.91	87.06	95.34	77.39	68.19	84.49	52.17	42.85	60.56
Northern State	80.61	72.08	89.14	54.97	41.65	68.28	41.68	28.97	54.39
El Matama	87.69	82.75	91.62	85.60	80.61	90.00	75.80	69.75	81.76
Shendi	74.35	68.50	80.17	75.89	68.50	82.70	33.05	23.84	43.94
Abu Hamad	58.03	48.72	67.69	73.48	67.54	78.93	39.09	30.93	47.56
Barbar	62.53	46.47	74.07	61.65	50.59	72.57	30.26	19.71	40.45
El Damar	90.78	85.61	95.07	88.02	83.41	91.84	72.38	65.79	79.08
Atbara	93.68	87.96	96.57	91.80	85.60	95.98	77.71	69.76	84.02
El Buhaira	85.38	82.18	88.72	63.71	58.86	69.15	43.48	37.71	50.38
River Nile State	79.55	72.20	86.91	79.65	73.14	86.15	53.98	45.43	62.53
Khartoum	94.77	91.84	97.44	90.91	85.44	95.19	80.51	72.86	86.80
Bahri	96.33	93.52	98.36	79.68	72.99	86.61	67.13	59.68	74.66
Um Durman	93.61	89.58	96.96	82.06	75.59	87.24	72.38	65.10	80.28
Um Bada	98.67	94.32	99.81	92.18	86.26	95.67	85.98	77.66	91.00
Jebel Awlia	89.41	84.38	94.08	84.35	78.92	89.98	73.24	67.11	79.70
Sharg Elneel	92.25	87.99	95.75	86.12	79.12	92.84	70.82	61.31	80.04
Karrari	94.86	91.09	97.51	92.08	84.77	96.61	80.57	72.65	87.80
Khartoum State	94.18	90.50	97.86	87.12	81.00	93.24	76.38	68.70	84.07
Greater Medani	91.59	87.74	94.78	79.64	74.01	84.21	70.74	64.11	77.23
Ganub Elgazira	90.47	85.41	93.83	84.27	77.13	89.94	71.93	63.13	79.14
El Hassahisa	96.26	93.97	98.44	90.80	85.46	94.75	81.98	75.32	86.79
El Kamlin	95.69	93.02	97.91	87.96	82.70	93.28	74.33	66.74	81.78
Sharg El Gezira	91.53	85.08	96.64	92.53	87.62	96.53	81.94	73.43	89.30
Um Elqura	91.70	88.48	94.59	90.28	85.30	94.31	77.96	73.38	82.72
El Manaqil	95.91	92.45	98.30	88.91	80.07	94.56	83.74	75.00	89.75
El Qurashi	88.43	73.33	95.82	88.96	78.91	95.64	79.34	64.97	87.88
Al-Gazeera State	93.14	87.96	98.32	87.94	81.63	94.26	78.40	70.56	86.23
Sennar	98.56	97.16	99.53	91.36	88.39	93.66	87.13	83.23	91.00
Sharg Sennar	53.55	42.02	65.81	63.15	49.82	77.43	37.13	25.20	49.57
Sinja	95.88	93.42	97.83	82.43	76.25	87.80	78.37	72.41	83.10

TABLE 52: Women's consumption of vitamin B-rich foods by locality and by state (continuation)

Location	Vitamin B6-Rich foods			Vitamin B12-Rich foods			Consumed Vitamin B1 / Carer: B2 / B3 / B6 / B12-Rich Foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Hujar	90.24	84.07	94.23	86.75	80.16	93.35	76.63	66.28	84.16
El Dali	96.58	92.87	99.05	93.62	89.87	96.98	87.24	82.11	91.72
Es Suki	97.01	94.87	98.80	91.75	85.63	96.36	87.33	81.43	91.81
Ed Dinder	96.51	88.13	99.56	95.72	92.45	98.63	91.90	83.56	97.18
Sennar State	88.48	82.58	94.37	85.42	78.18	92.65	76.47	68.95	83.99
Ed Damazine	97.18	94.49	98.95	81.06	72.59	88.72	79.05	71.83	86.59
El Tadamon	99.25	97.54	100.00	100.00	98.99	100.00	97.28	95.05	98.78
El Roseiris	94.18	91.14	96.70	82.43	76.33	88.13	79.53	73.12	86.22
Baw	92.60	85.53	97.93	93.75	84.49	100.00	88.46	78.21	96.76
Geisan	96.03	93.35	98.41	82.98	72.39	90.33	80.43	71.16	90.42
El Kurmuk	84.40	75.50	94.09	19.29	11.03	29.37	17.75	11.14	26.61
Wad El Mahi	98.79	95.45	100.00	83.53	66.91	96.12	81.98	63.95	94.78
Blue Nile State	94.65	90.15	99.16	77.82	69.19	86.44	75.51	66.93	84.09
Kosti	95.11	92.25	97.42	77.73	71.64	83.53	74.27	68.77	79.82
Guli	76.89	70.00	85.18	93.18	89.11	96.99	71.89	62.90	79.66
Tendalti	68.28	61.95	75.11	78.57	70.50	85.47	52.52	45.42	59.61
Es Salam	93.29	87.74	97.71	82.08	75.87	87.43	75.71	68.04	82.56
Rabak	88.87	84.02	93.56	78.38	71.73	84.92	64.68	58.17	71.79
El Jabalain	88.57	84.22	93.40	83.80	78.12	88.15	73.33	68.55	78.36
El Diwaim	96.85	94.20	98.84	96.70	93.94	98.64	87.45	83.40	90.66
Um Rimta	88.76	83.37	93.99	94.74	91.58	97.53	76.08	68.89	81.71
El Gitaina	98.17	95.67	99.80	98.37	96.33	99.60	94.59	90.43	98.17
White Nile State	90.60	86.16	95.04	86.50	81.48	91.51	76.16	70.17	82.15
Port Sudan	98.24	95.59	99.82	81.59	73.54	88.39	77.62	69.10	85.06
Swakin	47.97	38.29	58.57	73.50	63.36	82.97	30.81	20.95	40.82
El Gonob Welawlaib	58.02	46.96	68.31	99.47	98.20	100.00	45.23	34.78	54.70
Sinkat	42.65	26.97	58.58	50.21	39.26	59.22	17.27	9.50	25.25
Haya	20.14	9.69	28.39	40.55	32.68	47.78	15.18	8.72	22.64
Dordieb	29.79	18.43	42.52	87.57	80.57	94.75	17.66	9.22	26.53
Tokar	55.92	43.03	68.96	87.50	80.99	92.65	40.27	29.23	50.02
Agig	45.14	30.30	59.31	6.99	3.04	14.68	5.36	1.28	12.10
Gabaot Elma-aadin	88.93	83.63	93.15	87.73	76.46	95.86	67.75	56.13	78.44
Halaeeb (accessible parts)	79.49	60.52	91.08	72.64	56.85	86.86	52.00	32.80	66.99
Red Sea State	55.32	43.80	66.85	64.95	56.18	73.72	37.53	27.71	47.35
Kassala Town	96.11	92.73	98.19	95.49	92.11	98.20	72.80	65.40	78.60
Refi Kassla	64.98	51.43	75.86	66.42	56.60	75.87	32.56	23.91	41.05

TABLE 52: Women's consumption of vitamin B-rich foods by locality and by state (continuation)

Location	Vitamin B6-Rich foods			Vitamin B12-Rich foods			Consumed Vitamin B1 / Carer: B2 / B3 / B6 / B12-Rich Foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Western Kassala	90.71	84.50	94.56	86.69	82.38	90.96	63.12	56.01	70.11
New Halfa	83.59	74.18	91.53	81.35	73.64	87.87	54.81	45.94	63.03
Refi Nahr Atbara	81.51	72.47	89.71	95.38	91.16	98.32	64.92	53.75	74.58
Rural Khashm Elgirba	94.58	89.36	98.74	94.34	89.54	97.92	56.39	46.23	66.24
Rural Wad Elhilaiw	71.90	65.19	78.04	63.81	54.96	72.47	30.81	23.37	38.18
Rural Aroma	38.89	26.83	50.75	98.43	94.78	99.78	24.95	15.68	35.00
Refi North Delta	9.33	3.44	19.05	85.19	75.88	93.81	3.89	1.01	9.16
Refi Hamashkureib	67.08	54.81	77.34	97.29	94.34	99.39	61.54	49.98	70.50
Rural Telkok	47.30	38.05	59.20	88.50	81.82	94.74	31.39	25.36	37.51
Kassala State	70.29	61.09	79.50	88.07	81.91	94.23	49.23	40.57	57.88
Gedaref Town	92.11	86.84	95.89	74.74	63.10	83.96	61.27	48.57	74.31
Middle Geddaref	87.84	76.65	96.12	76.69	63.98	86.05	58.06	46.59	70.92
Elbutana	84.02	75.71	90.01	89.40	82.12	93.70	68.88	60.57	76.23
El Fashaga	76.28	67.49	85.15	72.35	57.73	85.37	52.21	39.96	63.05
El Rahad	88.13	80.94	93.28	67.98	59.32	77.38	55.65	47.66	67.33
Gala-a El Nahal	97.67	94.77	99.77	84.35	75.06	92.26	68.08	52.82	81.80
El Fao	65.49	58.02	73.46	80.99	72.35	89.44	52.53	46.82	57.91
El Qureisha	93.49	86.86	97.92	60.96	52.39	71.95	53.44	44.63	63.18
El Mafaza	89.53	79.33	96.05	84.82	79.40	89.52	51.53	42.36	59.25
Basunda	77.99	66.88	88.21	70.40	61.45	78.28	53.22	43.25	62.96
Western Galabat	96.46	92.38	99.21	55.41	38.21	75.59	45.97	24.89	66.13
Eastern Galabat	97.58	95.74	99.09	71.68	61.54	80.34	59.12	48.32	68.97
Al-Gadarif State	86.63	79.69	93.57	74.40	64.18	84.61	56.28	44.80	67.75
Sheikan	91.43	87.76	94.96	71.77	65.87	77.69	66.85	59.15	73.63
Um Rawaba	91.81	87.50	95.29	70.24	63.24	76.86	65.08	59.07	70.98
Um Dam Haj Ahmed	92.53	86.01	96.96	76.81	66.67	84.57	74.00	65.35	82.86
El Rahad	96.74	91.76	99.50	68.47	59.64	76.73	60.51	51.26	70.00
Bara	94.12	90.83	97.22	83.50	76.23	90.21	78.13	69.49	85.05
Gharb Bara	89.98	81.24	95.90	80.90	71.73	90.13	74.05	64.18	83.30
Soudari	73.00	63.56	81.72	86.27	81.59	90.06	57.81	50.83	64.85
Gebrat El Sheikh	82.06	73.57	90.08	88.89	84.46	93.17	72.11	63.20	79.38
North Kordofan State	88.72	82.82	94.63	77.20	70.36	84.04	67.47	59.54	75.39
Kadugli	85.22	79.32	90.83	55.12	46.36	62.95	51.94	45.05	59.15
Reif Shargi	88.33	79.88	95.40	54.07	46.63	63.15	51.86	43.02	61.08

TABLE 52: Women's consumption of vitamin B-rich foods by locality and by state (continuation)

Location	Vitamin B6-Rich foods			Vitamin B12-Rich foods			Consumed Vitamin B1 / Carer: B2 / B3 / B6 / B12-Rich Foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dilling	96.70	85.77	98.92	67.79	56.44	76.93	64.18	53.13	74.00
El Quoz	79.46	70.22	87.37	71.26	64.04	78.23	63.64	55.55	72.96
Habila	76.35	66.19	86.06	60.42	50.76	70.14	55.17	44.11	66.35
Abassiya	90.77	84.35	95.86	78.61	72.47	84.50	76.49	69.60	82.25
El Rashad	88.38	78.84	96.13	58.48	47.94	69.19	53.69	42.49	64.81
Abu Jubaiha	83.59	77.61	89.00	80.68	74.67	85.83	69.06	62.78	76.55
El Tadamon	90.27	79.69	96.77	83.56	74.66	90.63	79.66	69.99	87.14
Talodi	95.74	91.40	99.29	79.72	65.64	87.24	79.17	62.85	86.71
Ghadeer	97.54	95.00	99.63	75.96	62.66	87.58	73.24	62.03	83.61
El Leri	98.14	95.90	99.79	64.21	57.23	70.76	63.73	57.34	69.23
Abu Karshola	91.33	86.63	95.59	63.98	55.43	73.35	61.09	52.29	70.46
Delami	93.65	87.19	98.01	59.27	44.04	72.63	58.44	44.46	69.68
South Kordofan State	88.41	81.53	95.29	70.49	62.02	78.95	65.70	56.31	75.10
Abu Zabad	90.02	82.03	95.89	70.12	58.93	77.94	56.89	45.53	67.82
ElKhiwai	93.18	83.33	99.16	78.48	69.98	86.83	62.00	48.23	73.92
Ghubaish	67.39	60.44	75.00	60.81	53.22	68.88	44.66	37.27	53.73
El Nuhud	73.14	67.07	79.10	57.22	50.06	65.38	32.45	27.11	37.93
El Idia	84.71	72.48	92.76	77.33	63.59	88.49	59.58	44.90	73.10
Wad Benda	82.11	75.86	88.46	67.60	57.34	78.20	47.32	38.01	54.33
Lagawa	95.54	92.79	97.90	86.78	80.86	91.31	77.61	65.87	84.83
Elsunut	76.19	66.82	84.62	85.79	77.07	93.05	52.37	37.81	64.62
Keilik	98.79	94.77	100.00	89.20	82.35	93.04	82.73	74.02	88.59
Es Salam	85.57	81.60	89.16	67.25	60.42	73.56	46.95	40.21	53.89
Babanusa	91.27	83.78	95.77	82.45	75.10	88.26	60.17	53.19	67.54
Abyei	90.91	84.11	96.31	84.78	80.77	88.36	71.85	62.95	79.10
El Dibab	94.79	89.30	97.92	80.41	72.93	86.46	72.54	64.17	81.89
El Meiram	88.41	82.12	93.99	66.33	54.84	80.84	63.28	52.73	76.32
West Kordofan State	83.02	75.99	90.04	71.43	62.81	80.05	53.62	43.57	63.67
El Fasher	72.07	64.78	79.34	47.57	40.24	54.71	36.81	29.72	44.39
Tawila	97.21	94.89	98.79	32.92	20.73	45.40	24.22	14.64	36.29
Melit	84.73	79.26	89.81	36.90	28.06	48.37	20.16	13.36	28.75
Um Kadada	52.94	42.62	61.58	53.82	42.67	64.58	29.02	18.03	42.04
Kebkabiya	86.95	78.08	92.71	73.89	67.27	82.98	12.03	6.65	17.75
Kutum	86.86	82.31	91.18	43.93	31.88	56.20	35.33	26.02	44.22

TABLE 52: Women's consumption of vitamin B-rich foods by locality and by state (continuation)

Location	Vitamin B6-Rich foods			Vitamin B12-Rich foods			Consumed Vitamin B1 / Carer: B2 / B3 / B6 / B12-Rich Foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Mahalha	57.46	44.76	69.90	57.18	46.40	67.76	11.82	6.52	17.77
Saraf Omra	53.86	31.11	75.72	40.69	25.62	53.19	13.31	6.86	20.25
El Serief	20.38	15.47	25.11	27.08	20.92	33.33	16.36	12.13	20.58
Dar Elsalam	81.88	71.34	91.68	27.82	20.47	36.80	24.37	15.99	32.33
Kelemando	85.79	79.78	91.44	66.01	56.02	75.49	58.42	49.38	67.47
El Tawisha	72.08	66.82	77.14	60.70	51.89	68.75	33.33	23.82	42.73
Um Baru	90.96	72.60	97.32	79.77	69.63	87.72	41.33	29.24	53.15
El Lait	69.40	62.60	75.65	57.23	48.90	65.97	54.55	47.12	63.76
ELkuma	66.25	50.00	76.93	81.12	69.59	88.67	51.01	34.56	62.64
El Tina	55.56	32.78	88.89	22.22	0.00	44.44	11.11	0.00	33.33
Kernoi	50.68	45.49	56.15	78.63	72.24	84.35	33.47	29.05	38.53
North Darfur State	68.90	57.17	80.63	50.34	39.13	61.55	27.82	17.84	37.81
Nyala South	58.26	52.42	65.40	60.97	52.74	68.97	47.06	41.79	53.68
Nyala North	75.35	39.76	94.59	71.88	34.92	91.60	62.20	27.23	82.54
Es Salam	93.03	89.93	96.08	79.54	74.59	84.05	66.77	61.49	71.85
El Wihda	73.72	61.26	83.66	45.10	35.53	55.00	32.05	23.57	43.25
Mershing	90.28	86.36	94.38	67.98	60.39	76.02	55.77	47.62	63.32
Beliel	69.31	63.00	75.27	56.81	50.76	63.31	51.31	45.58	58.43
Nitega	79.60	72.59	86.08	67.59	59.33	76.40	40.39	28.18	50.28
Sharg El Jabal (accessible parts)	66.67	40.00	86.67	33.33	13.33	60.00	33.33	13.33	60.00
Kas	93.30	90.18	95.90	69.07	62.03	75.41	60.67	53.62	68.39
Shattaya	98.21	96.25	99.56	76.96	66.66	86.93	72.92	64.37	83.30
Buram	99.64	98.15	100.00	90.85	86.56	94.84	86.55	81.25	92.33
Gereida	99.01	96.52	100.00	82.57	72.18	92.01	80.15	69.52	89.33
El Sunta	99.43	98.01	100.00	91.19	84.74	95.46	87.50	81.87	92.61
El Radoum	100.00	99.09	100.00	93.59	89.41	97.05	87.18	80.88	93.63
Tulus	82.17	71.38	92.72	87.85	79.88	95.47	57.14	44.14	75.27
Damso	93.47	87.21	97.95	84.14	76.69	92.17	73.97	61.44	84.14
Ed Elfursan	93.93	85.92	99.12	67.09	59.41	74.06	38.88	32.40	44.81
Kubum	89.83	86.08	92.55	73.84	68.44	79.45	54.43	48.66	59.60
Kateila	78.92	64.86	91.76	48.29	39.68	58.17	35.83	29.32	42.65
Rehaid Elbirdi	95.48	92.99	97.70	83.73	77.60	89.95	68.47	59.75	77.83
Um Dafoug	95.74	92.80	97.99	81.75	75.37	88.14	60.34	48.36	72.78
South Darfur State	78.86	76.55	81.19	68.08	65.81	70.09	55.39	53.16	57.77
Abu Jabra	42.70	35.21	51.32	37.18	27.65	47.82	20.04	11.67	31.69

TABLE 52: Women's consumption of vitamin B-rich foods by locality and by state (continuation)

Location	Vitamin B6-Rich foods			Vitamin B12-Rich foods			Consumed Vitamin B1 / Carer: B2 / B3 / B6 / B12-Rich Foods		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Karinka	34.74	27.80	41.24	30.56	23.84	38.40	24.72	18.82	30.69
Bahr El Arab	23.15	16.98	30.16	11.84	7.51	16.30	10.84	6.71	15.94
Adila	11.63	6.47	19.47	40.03	32.18	48.64	8.52	5.54	12.11
Ed Dain	82.92	71.10	92.31	76.16	64.01	85.36	69.84	58.62	80.94
Assalaya	14.84	3.66	27.24	36.60	26.36	49.84	5.92	1.60	11.29
El Firdous	74.60	64.77	83.41	73.02	62.92	80.95	22.35	15.56	29.87
Shia-ria	67.16	55.18	82.30	69.32	54.77	82.30	68.53	54.14	80.15
Yassin	31.61	22.55	41.36	33.01	22.65	44.41	24.00	15.61	32.09
East Darfur State	38.98	30.37	47.58	41.61	32.22	51.01	25.05	17.67	32.44
El Geneina	88.94	81.83	94.13	85.95	77.25	91.92	76.68	68.63	85.78
Habila	50.72	42.56	59.31	62.68	53.07	73.15	43.67	34.48	52.37
Kulbus	83.37	66.99	95.23	90.83	86.59	95.31	76.67	64.10	88.72
Beida	81.62	75.49	87.45	96.30	91.13	99.51	75.38	66.44	83.58
Foro Baranga	72.42	63.37	81.09	67.20	58.79	75.60	58.68	49.82	66.68
Kereneik	82.88	79.05	87.32	73.78	68.91	77.77	72.08	66.83	76.72
Sirba	73.35	61.74	84.15	75.23	66.14	81.86	64.89	51.42	76.11
Jebel Moon	60.77	48.78	71.61	78.07	69.57	85.99	56.21	45.90	68.02
West Darfur State	78.06	68.48	87.64	80.83	74.39	87.27	68.76	58.77	78.74
Zalingi	49.42	39.80	58.58	47.97	37.49	58.83	34.33	25.43	45.41
Wadi Salih	93.99	86.50	99.43	92.63	84.41	99.09	90.60	82.89	96.93
Mukjar	90.57	82.38	97.02	87.10	80.96	93.49	81.29	72.32	89.55
Central Jebel Mara	96.38	88.72	100.00	94.93	85.07	100.00	69.01	58.27	78.58
North Jebel Mara	95.07	88.49	98.71	90.26	82.63	97.15	89.26	79.95	96.38
Bendasi	87.04	72.39	98.02	73.12	63.87	82.58	67.11	53.62	78.18
Nertiti	89.90	85.06	94.45	91.49	87.36	95.75	84.34	79.57	87.93
Azum	92.39	86.89	96.71	93.26	87.10	98.21	85.20	75.77	93.20
Um Dukhun	93.11	86.22	97.55	72.54	61.97	81.90	64.76	58.45	71.69
Central Darfur State	86.91	79.57	94.25	81.98	73.60	90.37	72.81	63.40	82.22
Sudan	83.42	76.06	90.79	76.90	68.90	84.91	62.13	53.13	71.13

Spatial distribution of women's vitamin B-rich foods consumption

Vitamin B1- and B2-rich foods consumption shared a similar spatial pattern, with near-even spread of high consumption across *Sudan (see Figure 192 and Figure 194)*. Vitamin B3-rich foods consumption had areas of decreased consumption in parts of Red Sea state, the northern area of Kassala state, parts of North and East Darfur states, and parts of West Kordofan state *(see Figure 196)*. Vitamin B6- and vitamin B12-rich foods consumption followed a similar pattern as vitamin B3-rich foods consumption, but with much smaller areas of low consumption *(see Figure 198 and Figure 200)*.

FIGURE 192:
Consumes vitamin B1-rich foods (raster)

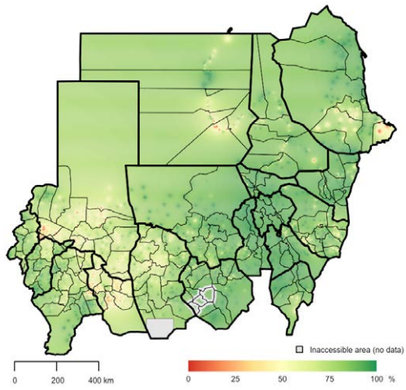


FIGURE 193:
Consumes vitamin B1-rich foods

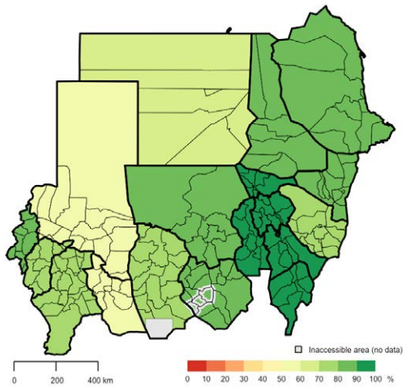


FIGURE 194:
Carer: Diet: consumes vitamin B2-rich foods (raster)

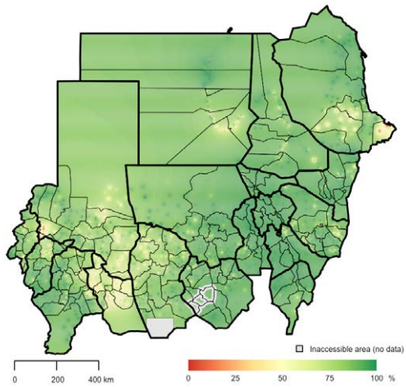


FIGURE 195:
Consumes vitamin B2-rich foods

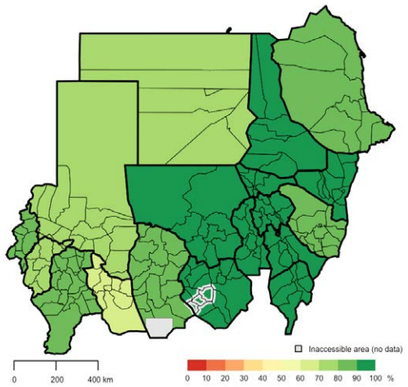


FIGURE 196:
Consumes vitamin B3-rich foods (raster)

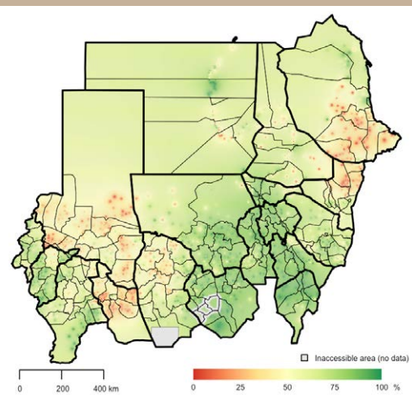


FIGURE 197:
Consumes vitamin B3-rich foods

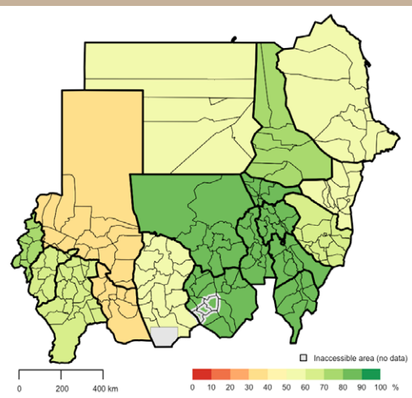


FIGURE 198:
Consumes vitamin B6-rich foods (raster)

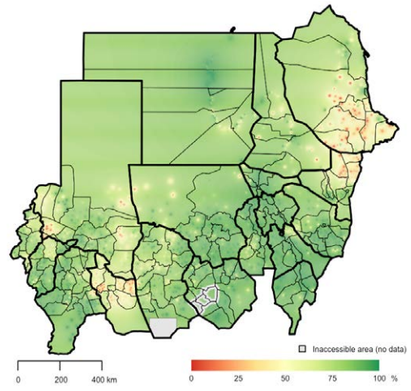


FIGURE 199:
Consumes vitamin B6-rich foods

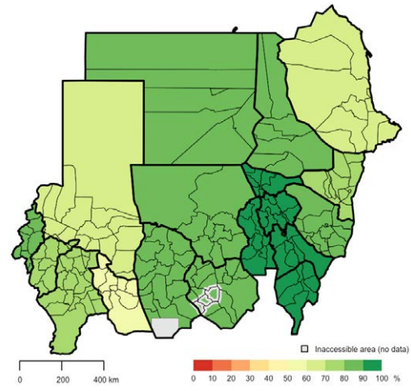


FIGURE 200:
Consumes vitamin B12-rich foods (raster)

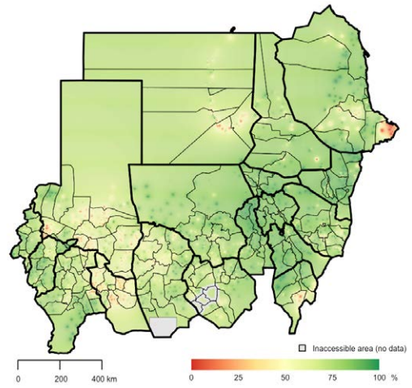


FIGURE 201:
Consumes vitamin B12-rich foods

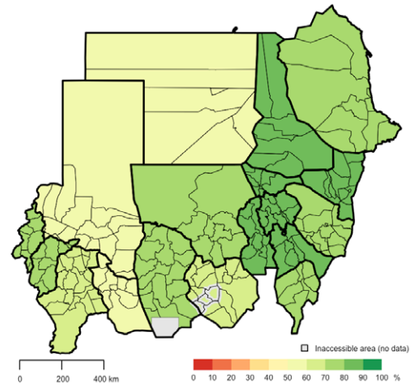


FIGURE 202:
Consumed vitamin B1- / B2- / B3- / B6- / B12-rich foods (raster)

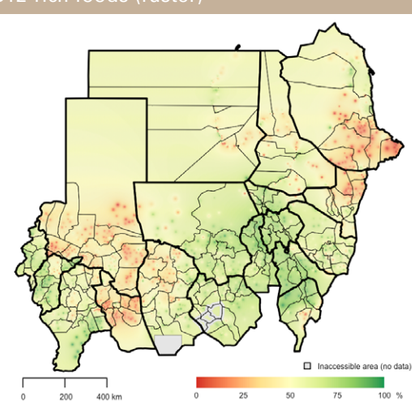
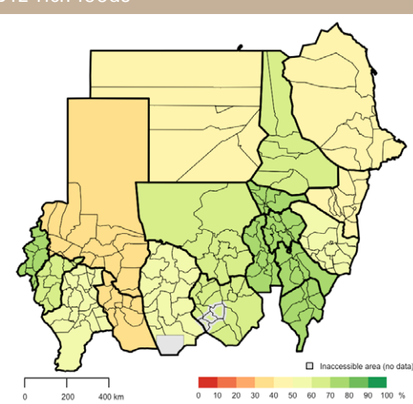


FIGURE 203:
Consumed vitamin B1- / B2 -/ B3- / B6- / B12-rich foods



3.8 Salt iodization

Salt iodization average results

Household iodized salt coverage was poor across the whole of Sudan, with the proportion of households with adequately iodized salt at 3.2 per cent (95 per cent CI: 0.01-6.49 per cent). The proportion of households with substandard or completely non-iodized salt was 96.8 per cent (95 per cent CI: 93.4-99.99 per cent). Across states, this low rate of salt iodization persisted with very little inter-state variation except for South Darfur, which had a significantly higher proportion of households with adequately iodized salt, at 21.1 per cent (95 per cent CI: 14.0-28.2 per cent) *(see Figure 204).*

Among localities, in only 1.6 per cent did more than 50 per cent of households have adequately iodized salt. There was little inter-locality variability- except for South Darfur, which accounted for all the localities in which 50 per cent or more of the households had salt with an adequate level of iodization *(see Figure 205).* Table 53 and Table 54 present per state, per locality and national level estimates of the households receiving adequately iodized salt in Sudan.

FIGURE 205: Box plot of locality results of salt iodization

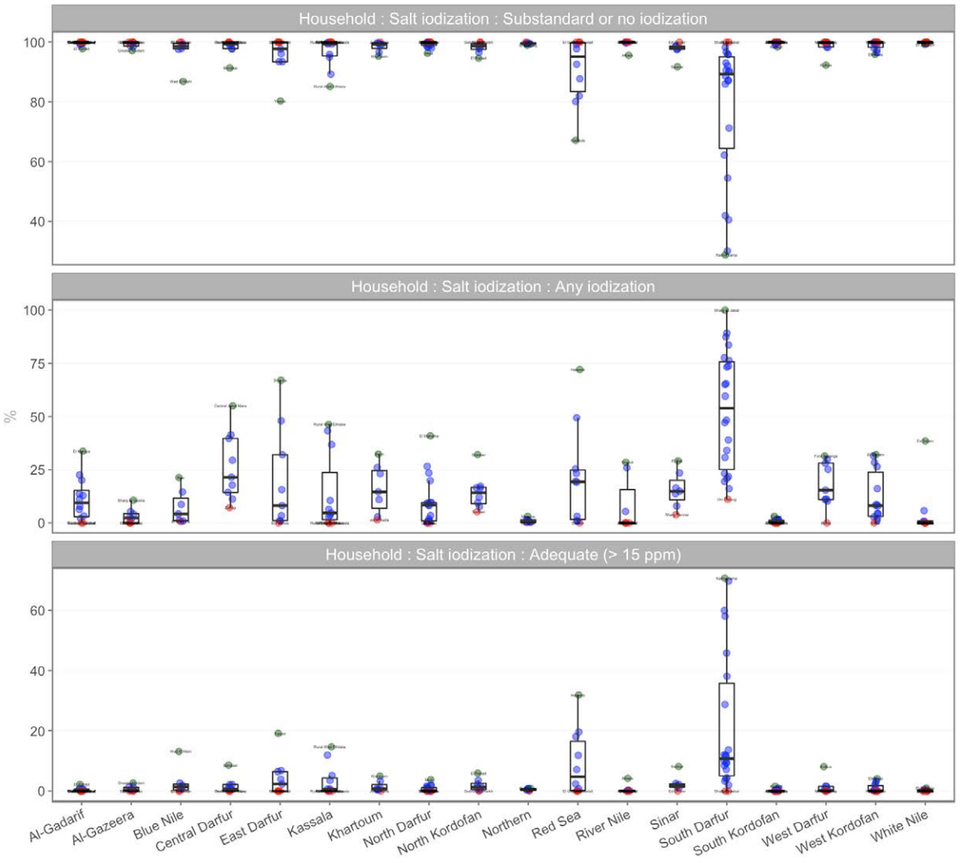


FIGURE 204: Box plot of locality results of salt iodization

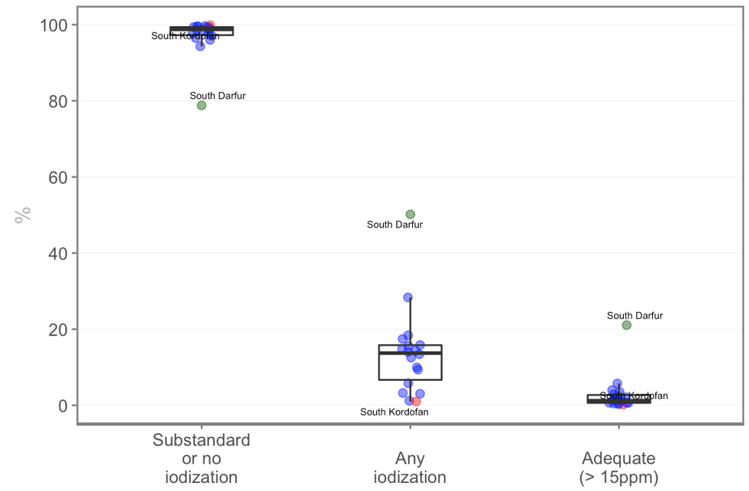


TABLE 53: Salt iodization by state and national

State	Substandard or no iodization %			Any iodization %			Adequate iodization at > 15 ppm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	99.55	98.44	99.99	14.02	2.92	25.13	0.46	0.01	1.60
Al-Gazeera	99.35	98.15	99.99	3.03	0.40	5.66	0.68	0.01	1.95
Blue Nile	97.79	94.95	99.99	5.78	0.67	10.89	2.12	0.01	5.09
Central Darfur	98.52	96.04	99.99	28.36	15.31	41.41	1.49	0.01	3.79
East Darfur	96.02	92.57	99.48	17.44	10.14	24.74	4.00	0.24	7.75
Kassala	96.51	91.82	99.99	12.53	6.40	18.66	3.52	0.01	7.99
Khartoum	98.72	96.96	99.99	14.31	6.56	22.05	1.29	0.01	3.08
North Darfur	99.35	98.08	99.99	9.95	3.31	16.60	0.65	0.01	1.90
North Kordofan	98.96	97.21	99.99	15.63	7.52	23.73	1.06	0.01	2.77
Northern	99.59	98.55	99.99	1.19	0.01	3.10	0.45	0.01	1.61
Red Sea	94.33	87.41	99.99	18.39	8.07	28.70	5.75	0.01	12.99
River Nile	98.86	95.44	99.99	13.42	4.79	22.05	1.12	0.01	4.59
Sennar	97.10	94.77	99.44	14.77	7.44	22.10	2.90	0.45	5.35
South Darfur	78.81	71.19	86.43	50.17	38.30	62.05	21.07	13.97	28.18
South Kordofan	99.85	99.33	99.99	0.98	0.01	3.35	0.16	0.01	0.64
West Darfur	97.90	93.72	99.99	15.86	7.09	24.63	2.13	0.01	5.70
West Kordofan	99.41	98.04	99.99	9.36	2.48	16.23	0.62	0.01	2.01
White Nile	99.66	98.96	99.99	3.23	0.01	6.56	0.33	0.01	1.06
Sudan	96.80	93.43	99.99	14.56	6.83	22.28	3.20	0.01	6.49

TABLE 54: Salt iodization by locality and by state

Location	Substandard or no iodization %			Any iodization %			Adequate iodization at > 15 ppm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	99.71	99.13	100.00	0.15	0.00	0.90	0.15	0.00	0.91
El Golid	99.79	98.95	100.00	0.20	0.00	1.03	0.20	0.00	1.04
Merwoe	99.65	97.98	100.00	2.77	0.64	5.46	0.57	0.00	1.94
El Daba	99.31	97.63	100.00	0.47	0.00	2.33	0.47	0.00	2.10
Halfa	100.00	100.00	100.00	1.51	0.17	5.37	0.00	0.00	0.00
Delgo	99.60	98.75	100.00	0.81	0.00	2.85	0.39	0.00	1.42
El Burgaig	99.20	97.50	100.00	1.87	0.00	4.48	0.81	0.00	2.65
Northern State	99.59	98.55	99.99	1.19	0.01	3.10	0.45	0.01	1.61
El Matama	100.00	100.00	100.00	0.00	0.00	0.88	0.00	0.00	0.00
Shendi	100.00	99.26	100.00	30.00	18.91	40.24	0.00	0.00	0.69
Abu Hamad	95.74	84.22	100.00	4.42	0.00	13.94	4.44	0.00	16.22
Barbar	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
El Damar	99.54	98.79	100.00	5.92	3.05	9.57	0.45	0.00	1.11
Atbara	95.50	89.75	99.52	38.10	25.60	53.46	4.44	0.44	10.51
El Buhaira	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
River Nile State	98.86	95.44	99.99	13.42	4.79	22.05	1.12	0.01	4.59
Khartoum	95.12	91.56	98.41	14.51	6.17	24.22	4.71	2.31	8.68
Bahri	99.15	97.08	100.00	30.00	17.66	43.24	0.92	0.00	2.80
Um Durman	96.73	93.03	99.10	23.18	15.90	30.88	3.32	0.99	6.93
Um Bada	99.43	98.28	100.00	3.73	1.34	7.05	0.57	0.00	1.93
Jebel Awlia	100.00	100.00	100.00	1.72	0.00	5.74	0.00	0.00	0.00
Sharg Elneel	99.80	98.19	100.00	26.44	17.10	38.76	0.38	0.00	1.78
Karrari	98.85	97.09	99.81	11.86	8.00	16.61	1.32	0.19	2.89
Khartoum State	98.72	96.96	99.99	14.31	6.56	22.05	1.29	0.01	3.08
Greater Medani	96.95	93.72	99.25	5.62	1.80	10.25	2.91	0.73	6.35
Ganub Elgazira	100.00	98.88	100.00	2.14	0.43	4.33	0.00	0.00	1.07
El Hassahisa	100.00	99.40	100.00	0.22	0.00	1.83	0.00	0.00	0.47
El Kamlin	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Sharg El Gezira	98.68	96.80	99.81	10.81	6.19	15.78	1.30	0.19	2.89
Um Elqura	98.53	96.56	100.00	5.18	2.57	8.17	1.41	0.21	3.06
El Manaqil	99.39	98.13	100.00	2.85	0.81	5.98	0.61	0.00	1.84
El Qurashi	100.00	100.00	100.00	0.00	0.00	0.68	0.00	0.00	0.00
Al-Gazeera State	99.35	98.15	99.99	3.03	0.40	5.66	0.68	0.01	1.95
Sennar	92.27	87.80	95.28	15.97	11.19	21.41	7.65	4.25	11.51
Sharg Sennar	98.76	96.77	100.00	3.45	0.36	7.82	1.22	0.00	3.40

TABLE 54: Salt iodization by locality and by state

Location	Substandard or no iodization %			Any iodization %			Adequate iodization at > 15 ppm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sinja	98.59	97.09	99.73	15.27	8.67	23.09	1.38	0.29	2.90
Abu Hujar	97.86	95.77	99.49	15.20	8.09	22.69	2.10	0.56	4.45
El Dali	97.37	95.15	99.43	25.34	16.21	34.87	2.51	0.58	4.70
Es Suki	98.06	94.76	99.79	8.05	3.49	14.14	2.11	0.21	5.23
Ed Dinder	99.78	98.81	100.00	28.27	16.17	40.07	0.22	0.00	1.19
Sennar State	97.10	94.77	99.44	14.77	7.44	22.10	2.90	0.45	5.35
Ed Damazine	99.21	97.98	100.00	3.94	0.69	8.98	0.69	0.13	1.88
El Tadamon	100.00	99.51	100.00	1.24	0.00	3.25	0.00	0.00	0.25
El Roseiris	100.00	99.65	100.00	0.66	0.00	1.74	0.00	0.00	0.30
Baw	97.63	94.31	99.40	19.47	11.48	28.87	2.42	0.61	5.76
Geisan	98.14	95.25	100.00	3.98	0.54	8.60	1.86	0.00	5.16
El Kurmuk	99.18	89.58	100.00	0.77	0.00	10.70	0.85	0.00	11.12
Wad El Mahi	88.58	84.32	92.66	13.15	8.71	18.63	11.48	7.13	15.89
Blue Nile State	97.79	94.95	99.99	5.78	0.67	10.89	2.12	0.01	5.09
Kosti	99.54	98.65	100.00	0.46	0.00	1.35	0.46	0.00	1.36
Guli	100.00	100.00	100.00	0.00	0.00	0.76	0.00	0.00	0.00
Tendalti	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Es Salam	100.00	100.00	100.00	38.18	25.60	47.91	0.00	0.00	0.00
Rabak	99.34	98.30	100.00	1.31	0.13	5.55	0.66	0.13	1.72
El Jabalain	98.56	96.53	99.80	8.35	4.00	13.58	1.58	0.20	4.05
El Diwaim	100.00	99.22	100.00	0.00	0.00	0.60	0.00	0.00	0.60
Um Rimta	100.00	99.29	100.00	0.00	0.00	1.31	0.00	0.00	0.81
El Gitaina	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
White Nile State	99.66	98.96	99.99	3.23	0.01	6.56	0.33	0.01	1.06
Port Sudan	98.39	94.22	100.00	4.09	0.91	13.53	1.62	0.00	5.44
Swakin	99.18	97.91	100.00	0.87	0.00	2.06	0.82	0.00	1.99
El Gonob Welawlaib	100.00	100.00	100.00	9.95	4.98	15.87	0.00	0.00	0.00
Sinkat	98.58	95.39	100.00	1.85	0.00	5.37	1.47	0.00	4.44
Haya	97.12	90.38	100.00	27.90	11.54	45.15	2.84	0.00	9.79
Dordieb	79.14	69.65	87.45	49.40	40.23	59.88	21.12	12.97	30.13
Tokar	98.73	96.36	100.00	4.50	1.54	8.02	1.17	0.00	3.46
Agig	82.68	73.29	91.93	18.63	10.30	27.71	17.35	9.00	26.22
Gabaot Elma-aadin	88.00	77.72	97.93	23.95	10.34	39.45	11.30	1.90	24.11
Halaeeb (accessible parts)	70.10	48.39	86.15	75.24	61.52	90.29	28.57	13.88	51.36
Red Sea State	94.33	87.41	99.99	18.39	8.07	28.70	5.75	0.01	12.99

TABLE 54: Salt iodization by locality and by state

Location	Substandard or no iodization %			Any iodization %			Adequate iodization at > 15 ppm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kassala Town	96.56	88.83	100.00	4.59	0.00	11.56	3.76	0.00	10.66
Refi Kassla	99.42	98.24	100.00	5.97	1.91	11.50	0.59	0.00	1.60
Rural Western Kassala	100.00	99.29	100.00	0.00	0.00	0.88	0.00	0.00	0.72
New Halfa	99.22	97.62	100.00	3.65	1.47	7.17	0.78	0.00	1.99
Refi Nahr Atbara	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Rural Khashm Elgirba	94.11	86.43	98.96	10.83	2.94	21.64	5.44	0.83	13.42
Rural Wad Elhilaiw	83.33	76.98	89.80	44.53	35.51	52.66	15.87	10.21	23.25
Rural Aroma	100.00	99.09	100.00	2.26	0.00	6.45	0.00	0.00	0.91
Refi North Delta	99.72	98.41	100.00	36.46	29.45	43.88	0.27	0.00	1.43
Refi Hamashkureib	88.18	78.06	96.03	44.37	33.56	57.01	12.02	2.91	21.05
Rural Telkok	100.00	100.00	100.00	0.00	0.00	1.03	0.00	0.00	0.00
Kassala State	96.51	91.82	99.99	12.53	6.40	18.66	3.52	0.01	7.99
Gedaref Town	99.16	97.33	100.00	7.69	2.05	17.77	0.71	0.00	2.83
Middle Geddaref	100.00	100.00	100.00	11.57	2.83	22.35	0.00	0.00	0.00
Elbutana	99.60	98.27	100.00	12.38	5.81	20.62	0.40	0.00	1.60
El Fashaga	99.43	98.00	100.00	8.30	3.73	14.29	0.58	0.00	1.96
El Rahad	98.16	95.38	99.80	11.98	1.81	28.93	1.64	0.00	4.45
Gala-a El Nahal	100.00	99.02	100.00	25.25	9.48	46.01	0.00	0.00	0.95
El Fao	100.00	100.00	100.00	21.93	11.90	31.77	0.00	0.00	0.00
El Qureisha	100.00	100.00	100.00	2.32	0.00	7.92	0.00	0.00	0.00
El Mafaza	99.40	98.38	100.00	55.08	31.75	74.47	0.59	0.00	1.64
Basunda	100.00	100.00	100.00	3.96	0.00	13.44	0.00	0.00	0.00
Western Galabat	100.00	100.00	100.00	0.00	0.00	0.61	0.00	0.00	0.00
Eastern Galabat	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Al-Gadarif State	99.55	98.44	99.99	14.02	2.92	25.13	0.46	0.01	1.60
Sheikan	99.11	98.25	99.73	27.21	19.53	35.19	0.90	0.27	1.82
Um Rawaba	97.98	96.42	99.26	16.03	8.64	25.07	2.00	0.98	3.68
Um Dam Haj Ahmed	96.90	92.35	99.59	6.95	2.28	14.49	3.12	0.39	7.66
El Rahad	98.29	93.73	100.00	13.69	6.16	23.14	1.72	0.00	6.21
Bara	99.60	98.44	100.00	13.72	6.91	21.82	0.41	0.00	1.45
Gharb Bara	99.05	97.43	100.00	13.05	4.99	22.72	0.94	0.00	2.57
Soudari	100.00	99.37	100.00	4.28	0.31	10.17	0.00	0.00	0.63
Gebrat El Sheikh	100.00	100.00	100.00	10.69	1.48	20.83	0.00	0.00	0.00

TABLE 54: Salt iodization by locality and by state

Location	Substandard or no iodization %			Any iodization %			Adequate iodization at > 15 ppm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
North Kordofan State	98.96	97.21	99.99	15.63	7.52	23.73	1.06	0.01	2.77
Kadugli	98.52	97.02	99.52	1.93	0.61	4.49	1.52	0.51	3.05
Reif Shargi	99.15	97.91	100.00	1.06	0.00	2.67	0.88	0.00	2.28
Dilling	100.00	100.00	100.00	1.85	0.00	6.09	0.00	0.00	0.00
El Quoz	100.00	100.00	100.00	0.78	0.00	2.92	0.00	0.00	0.00
Habila	100.00	98.79	100.00	0.39	0.00	2.85	0.00	0.00	1.35
Abassiya	100.00	100.00	100.00	1.44	0.00	3.78	0.00	0.00	0.00
El Rashad	100.00	99.55	100.00	0.42	0.00	3.06	0.00	0.00	0.47
Abu Jubaiha	100.00	99.40	100.00	0.59	0.00	1.91	0.00	0.00	0.59
El Tadamon	100.00	100.00	100.00	0.40	0.00	5.27	0.00	0.00	0.00
Talodi	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Ghadeer	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
El Leri	99.79	97.36	100.00	5.13	0.84	15.44	0.42	0.00	2.51
Abu Karshola	100.00	100.00	100.00	0.00	0.00	2.34	0.00	0.00	0.00
Delami	99.59	97.63	100.00	0.88	0.00	4.29	0.41	0.00	2.29
South Kordofan State	99.85	99.33	99.99	0.98	0.01	3.35	0.16	0.01	0.64
Abu Zabad	98.38	95.41	100.00	22.09	10.84	34.30	1.77	0.00	4.84
ElKhiwai	96.06	91.49	99.10	30.57	19.19	40.53	4.16	0.88	8.16
Ghubaish	100.00	99.03	100.00	3.49	0.00	10.44	0.00	0.00	1.02
El Nuhud	100.00	100.00	100.00	0.78	0.13	1.49	0.00	0.00	0.00
El Idia	99.03	97.31	100.00	16.92	9.31	24.91	1.15	0.00	2.61
Wad Benda	100.00	99.30	100.00	2.92	0.69	6.74	0.00	0.00	0.70
Lagawa	100.00	100.00	100.00	8.78	4.49	13.17	0.00	0.00	0.00
Elsunut	100.00	100.00	100.00	2.34	0.23	7.57	0.00	0.00	0.00
Keilik	100.00	100.00	100.00	0.00	0.00	2.90	0.00	0.00	0.00
Es Salam	99.77	98.96	100.00	7.63	3.96	12.34	0.33	0.00	0.95
Babanusa	99.79	98.89	100.00	24.40	13.74	34.78	0.21	0.00	1.09
Abyei	100.00	100.00	100.00	4.46	1.01	8.40	0.00	0.00	0.00
El Dibab	98.96	97.28	100.00	4.30	0.54	9.38	0.56	0.00	3.13
El Meiram	96.45	93.12	99.33	32.05	19.53	41.58	3.33	0.68	7.28
West Kordofan State	99.41	98.04	99.99	9.36	2.48	16.23	0.62	0.01	2.01
El Fasher	99.59	99.00	100.00	5.46	2.38	10.52	0.42	0.00	1.09
Tawila	98.35	95.56	100.00	20.95	11.42	31.55	1.54	0.00	4.55

TABLE 54: Salt iodization by locality and by state

Location	Substandard or no iodization %			Any iodization %			Adequate iodization at > 15 ppm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Melit	96.95	93.86	99.36	23.43	15.06	33.86	3.19	0.70	6.50
Um Kadada	98.41	97.06	99.46	9.54	5.63	14.78	1.63	0.66	2.99
Kebkabiya	100.00	100.00	100.00	0.90	0.00	4.52	0.00	0.00	0.00
Kutum	99.45	98.18	100.00	8.06	3.75	14.13	0.56	0.00	1.74
El Mahalha	98.28	96.37	99.67	37.77	26.84	49.19	1.56	0.30	3.48
Saraf Omra	98.95	95.93	100.00	21.15	10.78	35.30	1.10	0.00	3.53
El Serief	100.00	98.52	100.00	13.26	7.38	21.03	0.00	0.00	1.25
Dar Elsalam	100.00	100.00	100.00	2.62	0.71	5.40	0.00	0.00	0.00
Kelemando	99.83	98.97	100.00	1.86	0.37	3.87	0.17	0.00	0.88
El Tawisha	100.00	100.00	100.00	9.41	5.78	13.77	0.00	0.00	0.00
Um Baru	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
El Lait	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
ELkuma	99.00	96.56	100.00	0.93	0.00	3.55	0.90	0.00	3.31
El Tina	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Kernoi	100.00	100.00	100.00	1.13	0.21	2.63	0.00	0.00	0.00
North Darfur State	99.35	98.08	99.99	9.95	3.31	16.60	0.65	0.01	1.90
Nyala South	41.41	33.36	50.54	84.52	78.65	89.49	58.43	50.08	66.45
Nyala North	54.63	44.04	65.46	77.33	65.17	87.19	45.89	35.41	56.98
Es Salam	63.98	58.20	69.95	72.65	66.15	78.69	36.05	30.54	42.12
El Wihda	95.80	92.76	98.02	23.87	16.02	34.79	4.32	1.90	7.28
Mershing	89.97	83.09	95.12	45.84	35.59	56.32	9.79	4.63	16.32
Beliel	30.53	25.47	35.49	87.99	83.36	91.36	69.45	63.63	74.22
Nitega	89.20	82.54	94.20	66.58	60.66	72.36	10.65	5.71	17.05
Sharg El Jabal (accessible parts)	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
Kas	86.39	79.20	91.85	21.47	14.37	28.24	13.86	8.21	19.66
Shattaya	46.39	32.67	61.06	60.24	46.16	71.67	53.19	40.44	67.16
Buram	100.00	99.00	100.00	16.08	10.13	23.25	0.00	0.00	1.25
Gereida	87.72	75.71	96.02	38.65	26.28	54.87	12.57	5.02	24.90
El Sunta	86.28	79.51	92.10	74.05	61.41	85.47	13.74	7.82	21.28
El Radoum	89.94	80.03	96.47	18.29	5.89	31.52	10.13	2.55	19.36
Tulus	92.65	79.82	100.00	47.45	20.69	64.91	8.17	0.00	19.49
Damso	92.94	88.64	96.30	70.80	49.93	86.50	6.87	3.74	11.72
Ed Elfursan	90.93	85.54	94.51	34.75	23.26	46.70	9.25	4.82	14.85
Kubum	71.15	64.16	78.19	59.61	53.67	65.67	28.71	22.75	36.59
Kateila	96.67	93.67	98.78	29.63	18.57	43.56	3.26	1.08	6.11

TABLE 54: Salt iodization by locality and by state

Location	Substandard or no iodization %			Any iodization %			Adequate iodization at > 15 ppm %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rehaid Elbirdi	96.06	90.84	98.77	20.34	14.54	27.57	3.67	1.05	9.61
Um Dafoug	98.23	95.51	99.75	10.78	3.74	22.61	1.75	0.25	4.74
South Darfur State	78.81	71.19	86.43	50.17	38.30	62.05	21.07	13.97	28.18
Abu Jabra	100.00	98.31	100.00	1.29	0.00	5.06	0.00	0.00	1.68
Abu Karinka	95.05	92.10	97.72	42.24	32.88	50.24	4.77	2.49	8.07
Bahr El Arab	100.00	100.00	100.00	3.27	0.67	7.22	0.00	0.00	0.00
Adila	100.00	99.49	100.00	1.11	0.17	3.21	0.00	0.00	0.64
Ed Dain	94.77	90.72	97.43	12.52	6.57	20.30	5.48	2.42	9.63
Assalaya	93.45	89.35	96.54	15.72	9.75	22.68	6.47	3.56	10.61
El Firdous	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Shia-ria	93.18	88.45	97.04	66.50	48.21	79.44	6.81	3.22	11.31
Yassin	80.37	69.49	89.20	32.24	21.23	44.47	20.04	10.04	31.24
East Darfur State	96.02	92.57	99.48	17.44	10.14	24.74	4.00	0.24	7.75
El Geneina	97.37	94.93	99.09	13.55	7.07	22.16	2.91	0.98	4.97
Habila	100.00	100.00	100.00	11.16	4.32	23.13	0.00	0.00	0.00
Kulbus	92.61	81.22	99.36	23.29	10.99	37.12	7.86	1.02	19.85
Beida	100.00	100.00	100.00	0.00	0.00	0.35	0.00	0.00	0.00
Foro Baranga	99.47	98.26	100.00	24.73	17.03	33.22	0.53	0.00	1.75
Kereneik	99.47	98.61	100.00	25.26	18.09	32.63	0.53	0.00	1.49
Sirba	97.79	95.11	99.64	16.97	8.61	27.79	2.28	0.36	5.33
Jebel Moon	100.00	100.00	100.00	8.94	3.07	16.05	0.00	0.00	0.00
West Darfur State	97.90	93.72	99.99	15.86	7.09	24.63	2.13	0.01	5.70
Zalingi	98.18	96.58	99.31	14.51	8.23	22.41	1.82	0.60	3.38
Wadi Salih	99.36	98.43	100.00	29.23	21.15	38.48	0.62	0.00	1.68
Mukjar	97.95	95.87	99.31	17.87	11.45	24.35	2.06	0.65	4.48
Central Jebel Mara	100.00	100.00	100.00	56.03	32.09	79.73	0.00	0.00	0.00
North Jebel Mara	100.00	97.22	100.00	10.27	4.08	18.07	0.00	0.00	2.70
Bendasi	92.10	85.15	98.97	37.54	22.10	53.48	8.28	2.48	15.99
Nertiti	98.05	96.27	99.43	11.72	7.58	15.58	1.95	0.57	3.74
Azum	100.00	100.00	100.00	19.90	12.25	28.79	0.00	0.00	0.00
Um Dukhun	99.24	97.95	100.00	40.66	24.73	57.67	0.78	0.17	2.07
Central Darfur State	98.52	96.04	99.99	28.36	15.31	41.41	1.49	0.01	3.79

Spatial distribution of salt iodization

The proportion of households with access to adequately iodized salt was evenly low across Sudan, with pockets of moderate coverage in South Darfur *(see Figure 206, Figure 208 and Figure 210).*

FIGURE 206:
Household: Salt iodization: Substandard or no iodization (raster)

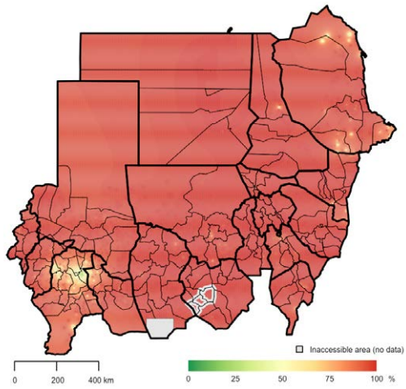


FIGURE 207:
Household: Salt iodization: Substandard or no iodization

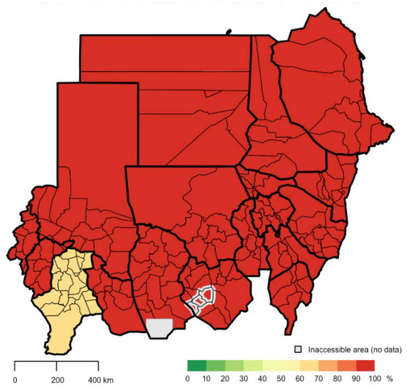


FIGURE 208:
Household: Salt iodization: Any iodization (raster)

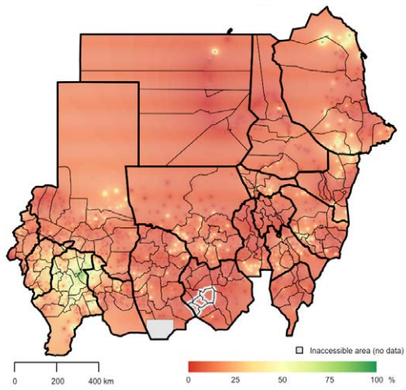


FIGURE 209:
Household: Salt iodization: Any iodization

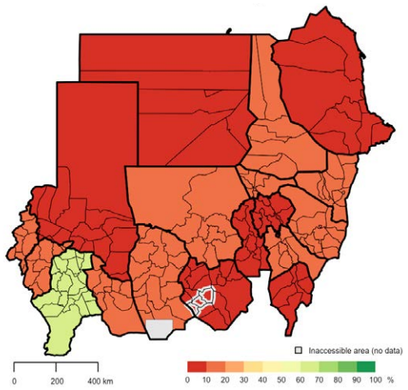


FIGURE 210:
Household: Salt iodization: Adequate (> 15 ppm) (raster)

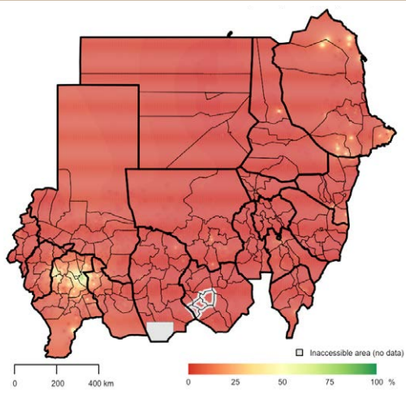
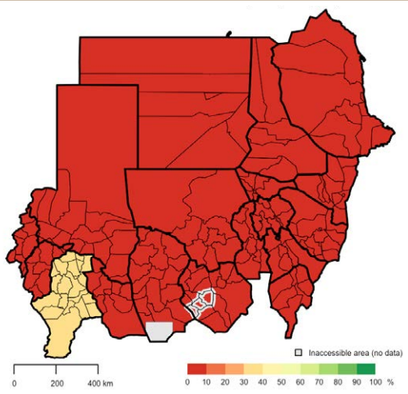


FIGURE 211:
Household: Salt iodization: Adequate (> 15 ppm)



3.9 Female genital mutilation

FGM prevalence in adult women average results

The proportion of all women carers of any age who underwent female genital mutilation (FGM) was 83.9 per cent (95 per cent CI: 73.7-94.1 per cent). The proportion of women aged 15-49 who underwent FGM was also 83.9 per cent (95 per cent CI: 73.7-94.2 per cent).

North Kordofan state had the most carers and women carers aged 15-49 years who underwent FGM at 97.7 per cent (95 per cent CI: 95.7-99.7 per cent) and 97.7 per cent (95 per cent CI: 95.8-99.6 percent), respectively. West Darfur and Central Darfur state had significantly lower rates than the rest of the country, both for all carers and for women aged 15-49 years who underwent FGM *(see Figure 212)*. Among localities, 84.9 per cent had more than 60 per cent of all women carers who underwent FGM, and 84.32 per cent had more than 60 per cent of women carers aged 15-49 years who underwent FGM.

Tables 55 to 60 present per state, per locality and national level estimates of women carers who underwent FGM by age group.

FIGURE 212: Box plot of state results of carers' experience of FGM

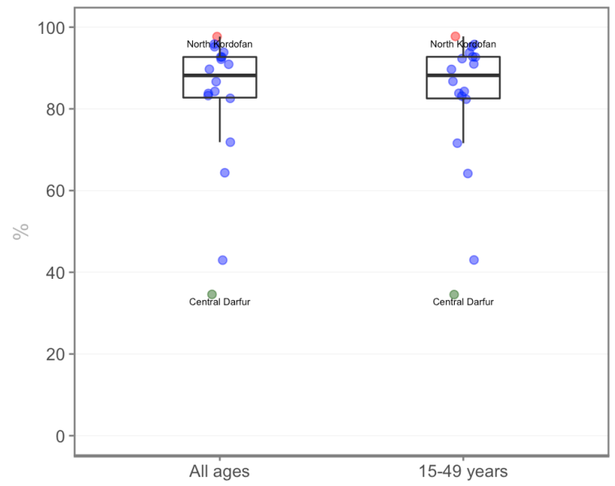


TABLE 55: Carers' circumcision (FGM) for all ages and for 15-49-year-olds by state and national

State	All ages %			15 - 49 years (MICS compatible) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	64.18	50.83	77.54	64.36	51.32	77.40
Al-Gazeera	84.27	71.88	96.66	84.27	71.78	96.77
Blue Nile	71.60	59.89	83.31	71.85	60.77	82.92

TABLE 55: Carers' circumcision (FGM) for all ages and for 15-49-year-olds by state and national

State	All ages %			15 - 49 years (MICS compatible) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Central Darfur	34.54	23.93	45.15	34.58	23.78	45.38
East Darfur	92.67	88.61	96.73	92.70	88.72	96.69
Kassala	92.76	83.54	99.99	92.70	84.17	99.99
Khartoum	83.13	72.83	93.44	83.25	72.72	93.78
North Darfur	82.36	71.20	93.51	82.58	71.92	93.24
North Kordofan	97.74	95.74	99.74	97.69	95.76	99.61
Northern	95.78	92.25	99.32	95.84	92.52	99.16
Red Sea	89.66	80.45	98.86	89.70	80.38	99.03
River Nile	95.22	90.53	99.92	95.20	90.82	99.57
Sennar	92.30	85.37	99.23	92.14	85.53	98.76
South Darfur	83.81	69.05	98.58	83.78	68.56	98.99
South Kordofan	86.73	75.56	97.89	86.66	75.17	98.16
West Darfur	43.02	30.12	55.93	42.97	29.72	56.23
West Kordofan	93.73	88.44	99.03	93.84	88.67	99.01
White Nile	90.98	83.52	98.43	90.91	83.19	98.62
Sudan	83.87	73.65	94.09	83.91	73.66	94.15

TABLE 56: Carers' circumcision (FGM) for all ages and for 15-49-year-olds by locality and by state

State	All ages %			15 - 49 years (MICS compatible) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	97.29	95.68	98.56	97.28	95.88	98.79
El Golid	87.87	80.00	93.46	87.71	81.56	93.36
Merwoe	99.40	97.78	100.00	99.37	97.38	100.00
El Daba	94.37	89.46	98.13	94.44	89.72	97.92
Halfa	97.26	94.54	99.30	97.27	94.83	99.26
Delgo	99.58	98.48	100.00	99.40	98.19	100.00
El Burgaig	94.66	91.23	97.47	94.59	91.21	97.14
Northern State	95.78	92.25	99.32	95.84	92.52	99.16
El Matama	97.84	95.52	99.78	98.02	95.66	99.56
Shendi	95.88	93.04	98.28	95.76	92.83	98.14
Abu Hamad	96.92	94.61	98.82	97.02	94.61	98.87
Barbar	96.03	92.70	98.59	95.88	92.74	98.45
El Damar	94.87	90.38	97.48	94.89	90.67	97.62

State	All ages %			15 - 49 years (MICS compatible) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Atbara	88.84	77.60	95.82	88.92	77.60	96.87
El Buhaira	98.44	96.79	99.71	98.49	96.55	99.62
River Nile State	95.22	90.53	99.92	95.20	90.82	99.57
Khartoum	89.39	85.02	93.33	89.46	84.54	92.51
Bahri	81.65	73.26	89.81	81.88	73.45	89.66
Um Durman	92.21	86.66	96.05	92.07	87.22	95.80
Um Bada	71.21	50.71	86.71	72.40	54.81	87.54
Jebel Awlia	71.80	58.75	84.27	71.75	58.80	84.88
Sharg Elneel	93.50	89.44	96.72	93.51	89.79	96.76
Karrari	90.17	82.70	95.43	90.35	83.63	95.45
Khartoum State	83.13	72.83	93.44	83.25	72.72	93.78
Greater Medani	78.22	65.75	87.89	78.26	65.39	86.74
Ganub Elgazira	82.47	69.95	91.25	82.00	70.34	90.86
El Hassahisa	86.83	75.19	96.00	87.45	75.28	95.60
El Kamlin	75.71	54.25	90.16	75.62	54.64	89.73
Sharg El Gezira	90.46	76.58	97.93	90.82	79.21	97.91
Um Elqura	87.08	69.28	95.94	86.53	70.09	95.05
El Manaqil	84.97	73.07	94.62	84.06	70.24	93.67
El Qurashi	88.99	74.08	97.56	88.92	73.32	97.51
Al-Gazeera State	84.27	71.88	96.66	84.27	71.78	96.77
Sennar	95.86	92.86	98.25	95.79	92.75	98.36
Sharg Sennar	87.19	79.05	93.99	87.12	77.71	93.83
Sinja	94.85	92.54	96.81	94.93	92.29	96.68
Abu Hujar	93.92	86.58	98.95	94.05	87.12	98.99
El Dali	99.05	97.16	100.00	98.88	97.34	100.00
Es Suki	86.23	75.47	94.97	86.12	73.29	95.50
Ed Dinder	93.46	82.24	98.90	94.04	84.06	98.91
Sennar State	92.30	85.37	99.23	92.14	85.53	98.76
Ed Damazine	89.97	81.57	95.84	90.31	82.85	95.85
El Tadamon	89.95	77.40	94.54	90.05	79.24	95.50
El Roseiris	66.75	54.56	79.20	66.59	55.23	79.15
Baw	50.75	39.07	58.41	50.60	40.80	59.59
Geisan	60.85	41.57	76.61	59.52	37.08	77.52
El Kurmuk	99.29	96.66	100.00	99.52	96.66	100.00
Wad El Mahi	40.36	24.65	57.39	39.45	24.09	55.13
Blue Nile State	71.60	59.89	83.31	71.85	60.77	82.92
Kosti	85.67	75.66	94.16	85.47	75.82	94.00
Guli	97.34	95.21	99.06	97.34	95.19	99.06

TABLE 56: Carers' circumcision (FGM) for all ages and for 15-49-year-olds by locality and by state

State	All ages %			15 - 49 years (MICS compatible) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Tendalti	86.27	80.68	91.22	86.64	80.89	91.25
Es Salam	97.53	95.39	99.02	97.45	95.64	98.86
Rabak	74.23	58.46	86.64	74.18	57.43	87.30
El Jabalain	95.45	90.80	99.06	95.58	89.96	99.06
El Diwaim	99.80	98.26	100.00	99.80	98.05	100.00
Um Rimta	99.19	97.49	100.00	99.18	97.36	100.00
El Gitaina	94.64	85.36	98.76	94.27	87.10	98.99
White Nile State	90.98	83.52	98.43	90.91	83.19	98.62
Port Sudan	75.77	57.83	91.81	75.00	57.32	89.97
Swakin	82.42	70.89	91.67	82.05	72.48	91.25
El Gonob Welawlaib	95.96	92.65	98.46	95.82	92.26	98.69
Sinkat	96.62	90.93	99.46	96.47	90.71	99.38
Haya	95.06	89.96	98.82	95.19	89.57	98.59
Dordieb	98.54	96.94	99.61	98.53	97.00	99.63
Tokar	97.34	93.61	99.62	97.46	94.10	99.61
Agig	89.39	84.59	93.77	89.44	84.81	93.45
Gabaot Elma-aadin	91.63	82.61	97.74	91.60	83.53	97.42
Halaeeb (accessible parts)	81.82	71.95	94.46	82.42	70.77	95.25
Red Sea State	89.66	80.45	98.86	89.70	80.38	99.03
Kassala Town	86.36	73.00	96.44	87.09	71.78	97.26
Refi Kassla	90.85	83.58	96.70	90.88	83.14	97.00
Rural Western Kassala	91.27	83.45	96.58	90.99	83.19	96.57
New Halfa	94.42	87.54	98.18	94.08	86.83	98.39
Refi Nahr Atbara	89.29	79.60	96.23	89.92	78.99	96.84
Rural Khashm Elgirba	92.05	77.67	99.79	92.10	77.63	99.79
Rural Wad Elhilaiw	66.72	49.40	83.97	66.85	51.50	83.35
Rural Aroma	98.00	95.82	99.16	98.03	96.01	99.36
Refi North Delta	99.75	98.64	100.00	99.74	98.52	100.00
Refi Hamashkureib	99.21	98.14	100.00	99.21	97.87	100.00
Rural Telkok	100.00	100.00	100.00	100.00	100.00	100.00
Kassala State	92.76	83.54	99.99	92.70	84.17	99.99
Gedaref Town	77.38	61.74	89.48	76.36	61.87	88.57
Middle Geddaref	87.99	77.90	94.06	88.48	80.26	94.60
Elbutana	97.14	90.69	99.81	96.65	89.31	99.81
El Fashaga	70.95	56.18	83.46	71.71	55.79	84.32
El Rahad	25.20	12.78	38.47	24.95	12.59	42.40
Gala-a El Nahal	70.16	58.73	81.45	70.35	59.34	81.29

TABLE 56: Carers' circumcision (FGM) for all ages and for 15-49-year-olds by locality and by state

State	All ages %			15 - 49 years (MICS compatible) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Fao	63.87	54.94	71.48	63.59	56.16	70.75
El Qureisha	69.88	51.31	85.55	69.66	52.29	83.83
El Mafaza	44.22	28.88	62.14	44.61	29.63	59.55
Basunda	61.82	44.92	77.40	62.27	47.11	77.34
Western Galabat	87.35	77.97	93.35	87.57	78.42	93.43
Eastern Galabat	61.09	43.98	77.80	61.32	43.98	78.21
Al-Gadarif State	64.18	50.83	77.54	64.36	51.32	77.40
Sheikan	95.81	93.06	97.84	95.63	93.17	97.86
Um Rawaba	98.77	97.61	99.63	98.66	97.48	99.63
Um Dam Haj Ahmed	98.75	96.34	100.00	98.78	96.71	100.00
El Rahad	98.04	95.71	99.75	98.25	95.81	99.75
Bara	97.97	95.77	99.26	97.93	95.85	99.44
Gharb Bara	97.09	94.75	99.07	97.28	94.68	99.12
Soudari	98.13	96.11	99.52	98.11	95.72	99.54
Gebrat El Sheikh	99.79	98.71	100.00	99.78	98.79	100.00
North Kordofan State	97.74	95.74	99.74	97.69	95.76	99.61
Kadugli	89.16	85.39	92.82	89.15	84.98	92.78
Reif Shargi	90.57	85.06	94.93	90.66	85.37	94.40
Dilling	52.79	27.22	76.37	52.77	29.77	76.09
El Quoz	92.40	87.95	96.19	92.50	87.27	96.15
Habila	89.69	86.04	92.90	89.53	86.15	92.86
Abassiya	91.42	86.81	95.52	91.50	85.80	95.34
El Rashad	71.31	48.47	91.15	71.46	46.71	92.27
Abu Jubaiha	96.03	93.90	98.11	95.98	93.81	98.09
El Tadamon	82.24	71.23	94.34	82.03	69.13	93.62
Talodi	92.09	76.43	97.18	92.14	74.50	97.18
Ghadeer	98.19	94.35	100.00	98.40	94.15	100.00
El Leri	97.68	95.82	98.99	97.70	95.99	99.17
Abu Karshola	97.11	92.12	99.79	97.06	92.46	99.79
Delami	51.76	26.28	75.78	52.94	27.96	78.02
South Kordofan State	86.73	75.56	97.89	86.66	75.17	98.16
Abu Zabad	97.84	95.67	99.23	97.66	95.91	99.22
ElKhiwai	98.75	97.09	99.79	98.94	97.43	99.79
Ghubaish	93.94	90.78	96.71	94.47	91.03	97.38
El Nuhud	95.02	91.63	97.45	94.84	91.95	97.38
El Idia	96.76	94.21	98.64	96.72	94.32	98.46
Wad Benda	99.31	98.28	100.00	99.31	98.25	100.00
Lagawa	96.19	93.60	98.23	96.93	94.35	98.88

TABLE 56: Carers' circumcision (FGM) for all ages and for 15-49-year-olds by locality and by state

State	All ages %			15 - 49 years (MICS compatible) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Elsunut	95.66	90.00	99.08	95.84	90.09	99.30
Keilik	97.10	94.50	99.04	97.28	94.40	99.28
Es Salam	88.01	84.72	91.58	87.84	83.88	91.64
Babanusa	98.90	97.23	99.79	98.89	97.25	99.80
Abyei	97.29	95.32	98.76	97.34	95.41	98.92
El Dibab	87.50	67.35	94.91	86.32	69.60	93.75
El Meiram	50.28	38.49	69.08	50.00	37.42	69.16
West Kordofan State	93.73	88.44	99.03	93.84	88.67	99.01
El Fasher	87.97	82.79	92.21	87.70	82.27	92.03
Tawila	34.05	17.75	51.66	33.48	17.46	50.56
Melit	94.61	91.08	97.29	94.73	91.11	97.38
Um Kadada	95.12	93.02	96.87	94.93	92.61	96.85
Kebkabiya	52.26	46.02	57.89	51.75	45.43	57.37
Kutum	86.97	72.84	95.69	87.10	72.84	96.06
El Mahalha	93.92	85.89	98.96	94.56	85.98	99.27
Saraf Omra	58.13	42.62	73.19	58.56	41.38	72.40
El Serief	95.19	92.69	97.31	95.13	92.60	97.04
Dar Elsalam	68.38	45.92	87.87	69.32	48.75	88.41
Kelemando	95.70	93.72	97.75	95.84	93.66	98.07
El Tawisha	95.11	92.33	97.34	95.11	92.15	97.09
Um Baru	99.02	96.11	100.00	99.10	95.95	100.00
El Lait	89.57	85.96	92.72	89.45	86.41	92.52
ELkuma	98.94	95.31	100.00	98.72	96.21	100.00
El Tina	77.78	44.44	100.00	77.78	44.44	100.00
Kemoi	87.33	83.79	90.95	86.88	83.07	90.56
North Darfur State	82.36	71.20	93.51	82.58	71.92	93.24
Nyala South	94.60	91.79	97.35	94.61	91.99	97.02
Nyala North	88.24	72.14	97.48	88.89	72.83	98.04
Es Salam	94.51	86.79	97.44	95.03	85.90	97.42
El Wihda	83.33	77.51	89.10	83.28	77.91	88.99
Mershing	94.02	89.22	97.04	93.82	88.92	96.93
Beliel	91.07	87.46	94.01	91.19	87.67	94.60
Nitega	96.37	93.89	98.52	96.36	94.04	98.19
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00
Kas	89.69	80.54	96.62	89.32	80.09	96.29
Shattaya	67.63	49.89	85.41	67.41	50.73	83.89
Buram	82.97	77.56	86.85	82.73	78.04	87.06

TABLE 56: Carers' circumcision (FGM) for all ages and for 15-49-year-olds by locality and by state

State	All ages %			15 - 49 years (MICS compatible) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Gereida	88.15	76.19	94.66	89.07	77.70	94.88
El Sunta	98.58	96.58	100.00	98.57	96.02	99.72
El Radoum	95.97	92.67	98.16	95.92	92.20	98.33
Tulus	43.20	13.33	89.21	43.98	11.72	83.16
Damso	53.77	30.26	73.12	53.74	29.30	72.91
Ed Elfursan	87.15	82.31	91.18	86.89	82.15	92.11
Kubum	90.30	86.70	94.10	90.15	87.05	93.75
Kateila	94.67	92.07	97.48	94.62	91.77	97.27
Rehaid Elbirdi	81.74	69.56	93.05	81.02	67.49	91.96
Um Dafoug	97.99	95.80	99.50	98.00	95.63	99.50
South Darfur State	83.81	69.05	98.58	83.78	68.56	98.99
Abu Jabra	99.34	97.66	100.00	99.35	97.54	100.00
Abu Karinka	95.99	91.16	99.17	96.09	91.53	98.92
Bahr El Arab	96.20	92.47	99.06	96.20	91.93	99.37
Adila	63.20	55.00	71.51	62.85	55.80	70.58
Ed Dain	97.63	95.47	99.28	97.39	95.45	99.11
Assalaya	95.55	91.64	98.21	95.46	91.56	98.23
El Firdous	98.17	95.31	99.77	98.15	95.43	99.77
Shia-ria	96.52	93.29	98.64	96.92	94.06	98.91
Yassin	97.39	95.36	98.75	97.28	95.39	98.78
East Darfur State	92.67	88.61	96.73	92.70	88.72	96.69
El Geneina	55.88	45.38	67.46	56.27	46.42	65.88
Habila	39.05	24.50	56.43	39.10	25.68	56.65
Kulbus	47.01	33.37	62.00	47.77	33.45	64.18
Beida	41.32	25.74	57.88	41.19	24.12	57.14
Foro Baranga	30.82	17.87	46.24	29.52	18.39	44.62
Kereneik	26.35	16.73	34.55	25.95	17.32	35.74
Sirba	15.10	5.94	27.65	15.57	5.88	27.36
Jebel Moon	57.63	41.76	71.83	58.46	44.70	72.26
West Darfur State	43.02	30.12	55.93	42.97	29.72	56.23
Zalingi	46.10	34.29	57.52	46.09	33.06	57.77
Wadi Salih	34.19	21.99	47.92	34.20	22.12	48.60
Mukjar	44.84	32.81	56.12	44.91	34.14	56.45
Central Jebel Mara	0.00	0.00	4.55	0.00	0.00	4.45
North Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00
Bendasi	85.52	76.14	93.46	85.25	74.41	92.77
Nertiti	15.29	3.35	32.84	15.75	4.24	30.56
Azum	26.92	16.12	39.14	26.23	16.10	38.45

TABLE 56: Carers' circumcision (FGM) for all ages and for 15-49-year-olds by locality and by state

State	All ages %			15 - 49 years (MICS compatible) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Um Dukhun	61.61	51.11	72.21	61.55	50.10	72.94
Central Darfur State	34.54	23.93	45.15	34.58	23.78	45.38

Spatial distribution of FGM in adult women

There was an almost-even spatial spread to the high rate of women carers who had undergone FGM in Sudan. However, there were pockets of lower prevalence in parts of West and Central Darfur and Al-Gadarif state *(see Figure 213 and Figure 215)*.

FIGURE 213:
Carer: Carer is circumcised (FGM): All ages (raster)

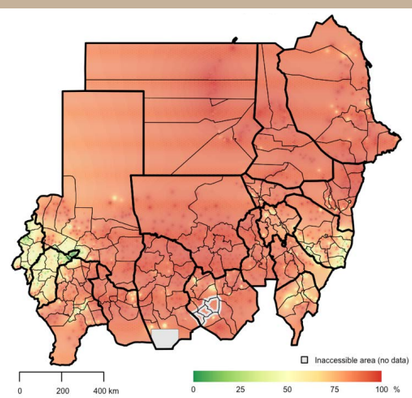


FIGURE 214:
Carer: Carer is circumcised (FGM): All ages

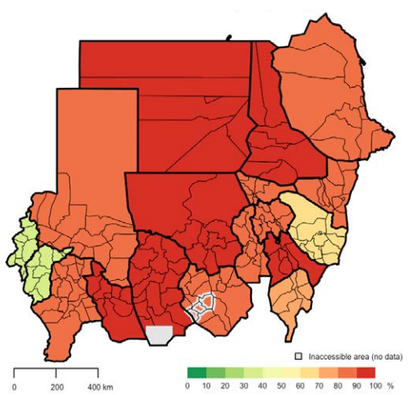


FIGURE 215:
Carer: Carer is circumcised (FGM): 15 - 49 years (MICS compatible) (raster)

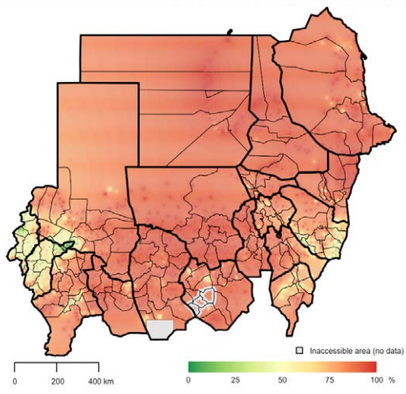


FIGURE 216:
Carer: Carer is circumcised (FGM): 15 - 49 years (MICS compatible)

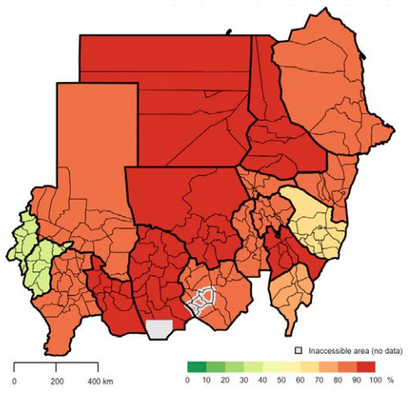


TABLE 57: Carers' circumcision (FGM) for 15-19 years, 20-24 years, 25-29 years and 30-34 years of age by state and national

State	15 - 19 years of age %			20 - 24 years of age %			25 - 29 years of age %			30 - 34 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	69.55	43.65	95.45	64.03	47.65	80.42	60.47	44.20	76.73	66.53	48.70	84.36
Al-Gazeera	79.12	46.34	99.99	82.25	65.58	98.92	84.49	69.47	99.52	86.82	72.49	99.99
Blue Nile	75.58	51.68	99.47	75.06	60.23	89.89	66.16	51.29	81.03	76.69	62.92	90.46
Central Darfur	28.14	10.60	45.67	35.61	21.79	49.44	36.18	24.22	48.13	33.55	18.84	48.26
East Darfur	96.89	88.75	99.99	93.26	86.87	99.64	92.87	86.98	98.75	91.56	84.51	98.60
Kassala	87.73	63.36	99.99	91.75	78.95	99.99	92.38	82.67	99.99	94.10	84.18	99.99
Khartoum	77.74	46.07	99.99	81.94	67.57	96.30	82.02	71.72	92.32	86.34	74.70	97.98
North Darfur	75.33	45.31	99.99	82.14	70.43	93.85	83.85	73.36	94.35	81.35	62.71	99.98
North Kordofan	99.28	95.42	99.99	96.95	92.74	99.99	98.15	95.53	99.99	98.60	95.61	99.99
Northern	98.36	84.06	99.99	95.03	87.32	99.99	93.84	87.93	99.75	97.97	94.52	99.99
Red Sea	80.39	47.33	99.99	88.58	75.16	99.99	89.63	77.53	99.99	91.29	80.79	99.99
River Nile	93.78	79.34	99.99	94.01	85.77	99.99	94.87	89.05	99.99	96.21	89.65	99.99
Sennar	97.18	86.68	99.99	87.71	77.03	98.40	92.96	84.40	99.99	93.20	85.07	99.99
South Darfur	80.03	51.84	99.99	84.24	66.33	99.99	83.67	66.60	99.99	84.22	67.48	99.99
South Kordofan	81.30	62.50	99.99	85.82	73.43	98.20	87.69	75.89	99.49	87.37	72.66	99.99
West Darfur	36.66	13.48	59.83	44.71	27.25	62.17	40.92	26.70	55.15	41.73	23.43	60.02
West Kordofan	92.17	75.10	99.99	94.46	86.75	99.99	93.62	87.11	99.99	94.90	87.04	99.99
White Nile	87.93	72.19	99.99	90.76	80.91	99.99	90.52	81.51	99.54	93.48	84.91	99.99
Sudan	80.98	55.65	99.99	83.23	69.85	96.61	83.41	71.75	95.07	85.39	72.65	98.13

TABLE 58: Carers' circumcision (FGM) for 15-19 years, 20-24 years, 25-29 years and 30-34 years of age by locality and by state

Location	15 - 19 years of age %			20 - 24 years of age %			25 - 29 years of age %			30 - 34 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	100.00	83.30	100.00	100.00	97.50	100.00	96.15	91.56	99.44	98,16	94,88	100,00
El Golid	88.89	33.33	100.00	76.84	60.80	91.31	84.77	73.71	92.95	94,07	87,80	99,03
Merwoe	100.00	100.00	100.00	100.00	96.51	100.00	100.00	100.00	100.00	100,00	95,38	100,00
El Daba	100.00	74.82	100.00	93.06	80.95	100.00	90.78	83.46	97.00	97,65	92,30	100,00

TABLE 58: Carers' circumcision (FGM) for 15-19 years, 20-24 years, 25-29 years and 30-34 years of age by locality and by state

Location	15 - 19 years of age %			20 - 24 years of age %			25 - 29 years of age %			30 - 34 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Halfa	100.00	100.00	100.00	100.00	97.95	100.00	95.96	89.56	100.00	95,12	90,36	98,61
Delgo	100.00	100.00	100.00	100.00	94.73	100.00	99.12	94.95	100.00	100,00	96,94	100,00
El Burgaig	100.00	100.00	100.00	92.13	82.91	98.88	89.17	80.00	96.24	97,52	91,13	100,00
Northern State	98.36	84.06	99.99	95.03	87.32	99.99	93.84	87.93	99.75	97.97	94.52	99.99
El Matama	100.00	90.48	100.00	95.42	88.46	100.00	100.00	96.08	100.00	98,15	88,89	100,00
Shendi	88.57	71.85	100.00	96.30	90.72	100.00	94.93	89.47	98.82	97,66	91,33	100,00
Abu Hamad	91.30	50.00	100.00	94.29	87.62	98.95	93.69	87.03	98.37	100,00	100,00	100,00
Barbar	100.00	84.62	100.00	95.92	88.46	100.00	95.73	89.62	100.00	94,83	87,68	100,00
El Damar	94.74	80.33	100.00	96.35	92.19	99.56	94.65	91.05	97.64	94,04	85,65	98,74
Atbara	84.85	53.85	100.00	79.70	57.87	94.26	87.30	73.28	98.02	93,10	81,39	99,44
El Buhaira	100.00	100.00	100.00	95.49	89.85	100.00	97.86	94.62	100.00	100,00	97,77	100,00
River Nile State	93.78	79.34	99.99	94.01	85.77	99.99	94.87	89.05	99.99	96.21	89.65	99.99
Khartoum	100.00	66.35	100.00	83.33	66.01	95.45	83.33	74.55	91.38	93,84	88,05	98,37
Bahri	100.00	100.00	100.00	84.40	73.03	93.19	76.56	65.91	86.93	82,68	70,20	92,66
Um Durman	86.84	59.96	100.00	93.06	78.82	100.00	91.71	83.79	96.93	90,27	79,38	96,99
Um Bada	63.64	30.75	94.72	62.16	40.55	80.59	79.74	63.01	90.19	78,07	60,15	91,94
Jebel Awlia	45.45	7.68	100.00	76.74	58.81	92.18	66.30	49.98	80.53	76,34	59,65	89,75
Sharg Elneel	97.06	82.60	100.00	98.10	92.85	100.00	92.09	84.85	96.91	94,69	88,87	99,04
Karrari	66.67	27.72	100.00	81.19	67.07	93.03	90.30	81.80	96.78	95,42	86,91	99,32
Khartoum State	77.74	46.07	99.99	81.94	67.57	96.30	82.02	71.72	92.32	86.34	74.7	97.98
Greater Medani	55.00	22.14	100.00	68.93	49.02	84.62	78.82	62.05	91.23	79,39	65,58	90,80
Ganub Elgazira	57.89	11.11	92.86	77.11	58.32	93.06	84.82	67.79	96.52	82,83	69,55	93,03
El Hassahisa	86.96	56.81	100.00	90.36	77.76	97.20	89.78	73.39	99.10	84,06	64,77	95,84
El Kamlin	90.91	55.47	100.00	75.76	53.15	93.42	68.55	41.54	90.95	82,35	63,33	97,11
Sharg El Gezira	94.44	70.79	100.00	86.81	69.67	97.56	89.19	75.37	97.54	90,00	74,99	98,43
Um Elqura	72.22	40.00	100.00	82.47	55.42	97.50	87.86	70.96	97.56	83,19	65,68	93,40
El Manaqil	88.24	54.14	100.00	83.81	69.46	95.28	84.68	72.07	95.25	92,52	71,96	100,00
El Qurashi	85.00	46.65	100.00	87.10	69.39	98.65	88.05	67.27	100.00	90,67	74,09	100,00
Al-Gazeera State	79.12	46.34	99.99	82.25	65.58	98.92	84.49	69.47	99.52	86.82	72.49	99.99
Sennar	94.12	78.24	100.00	88.80	78.72	97.21	97.17	92.18	99.64	95,42	90,14	99,44
Sharg Sennar	100.00	87.27	100.00	79.69	64.06	92.87	89.53	81.58	96.24	87,50	77,57	95,95
Sinja	92.31	64.68	100.00	88.74	80.72	95.80	92.90	88.35	97.08	99,38	96,74	100,00
Abu Hujar	95.31	82.04	100.00	91.57	81.39	98.29	96.08	86.87	100.00	91,60	83,81	98,59
El Dali	100.00	92.49	100.00	97.81	93.43	100.00	99.44	96.98	100.00	99,05	94,80	100,00
Es Suki	100.00	100.00	100.00	82.20	66.65	92.94	86.21	70.05	97.35	91,01	78,56	99,04

TABLE 58: Carers' circumcision (FGM) for 15-19 years, 20-24 years, 25-29 years and 30-34 years of age by locality and by state

Location	15 - 19 years of age %			20 - 24 years of age %			25 - 29 years of age %			30 - 34 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ed Dinder	100.00	84.58	100.00	93.50	83.33	99.12	93.21	77.51	100.00	92,31	80,70	100,00
Sennar State	97.18	86.68	99.99	87.71	77.03	98.40	92.96	84.40	99.99	93.2	85.07	99.99
Ed Damazine	85.11	62.45	100.00	93.50	84.14	98.64	91.09	78.05	98.10	90,51	82,18	96,09
El Tadamon	87.50	35.69	100.00	90.11	77.06	97.68	84.57	72.04	92.11	92,86	74,13	100,00
El Roseiris	75.00	48.14	93.95	69.92	53.97	81.53	65.62	47.93	79.40	70,37	54,27	84,40
Baw	52.94	34.38	72.31	63.77	45.61	78.09	25.93	14.15	40.37	76,60	57,87	97,44
Geisan	48.4	18.75	91.67	59.72	37.60	80.02	50.00	24.37	77.21	70,67	49,92	85,72
El Kurmuk	96.30	78.55	100.00	100.00	100.00	100.00	100.00	93.66	100.00	100,00	100,00	100,00
Wad El Mahi	74.07	45.45	93.11	42.68	23.37	61.63	35.37	19.86	53.85	34,35	17,51	54,46
Blue Nile State	75.58	51.68	99.47	75.06	60.23	89.89	66.16	51.29	81.03	76.69	62.92	90.46
Kosti	67.24	44.98	89.30	86.39	74.28	95.46	88.50	78.82	95.90	90,18	77,56	98,37
Guli	90.48	73.32	100.00	100.00	96.61	100.00	98.79	94.40	100.00	96,33	89,49	100,00
Tendalti	88.57	66.67	100.00	89.72	79.11	97.49	86.18	76.47	93.52	94,62	82,76	100,00
Es Salam	100.00	92.26	100.00	97.62	91.74	100.00	95.29	90.06	98.73	99,07	95,24	100,00
Rabak	77.50	54.51	94.32	66.67	47.32	83.11	73.04	57.77	86.72	78,16	59,51	90,45
El Jabalain	92.86	72.70	100.00	97.48	89.00	100.00	93.53	84.79	100.00	95,35	88,03	100,00
El Diwaim	100.00	100.00	100.00	100.00	97.10	100.00	100.00	98.37	100.00	100,00	94,59	100,00
Um Rimta	100.00	89.99	100.00	100.00	97.76	100.00	100.00	100.00	100.00	100,00	94,67	100,00
El Gitaina	98.00	82.57	100.00	94.64	80.71	100.00	91.04	76.83	99.19	96,25	87,73	100,00
White Nile State	87.93	72.19	99.99	90.76	80.91	99.99	90.52	81.51	99.54	93.48	84.91	99.99
Port Sudan	62.50	0.00	100.00	71.01	47.56	89.49	74.53	53.83	92.78	78,79	63,26	92,11
Swakin	82.46	56.50	97.68	83.49	66.65	95.01	82.68	73.44	92.03	77,01	64,21	90,13
El Gonob Welawlaib	100.00	100.00	100.00	94.20	86.67	100.00	90.62	81.05	97.92	100,00	92,54	100,00
Sinkat	93.10	70.94	100.00	97.89	94.15	100.00	97.86	90.06	100.00	94,64	85,68	100,00
Haya	92.00	66.52	100.00	94.17	85.35	100.00	94.59	84.14	100.00	98,57	92,28	100,00
Dordieb	100.00	100.00	100.00	97.25	92.48	100.00	99.46	96.36	100.00	100,00	100,00	100,00
Tokar	100.00	100.00	100.00	100.00	100.00	100.00	95.11	87.56	100.00	97,22	91,80	100,00
Agig	100.00	100.00	100.00	89.47	72.71	100.00	97.76	93.06	100.00	84,88	75,10	92,04
Gabaot Elma-aadin	100.00	100.00	100.00	88.37	71.99	100.00	96.15	86.02	100.00	96,00	88,46	100,00
Halaeeb (accessible parts)	NA	NA	NA	79.17	54.51	100.00	89.29	72.38	100.00	86,05	67,31	100,00
Red Sea State	80.39	47.33	99.99	88.58	75.16	99.99	89.63	77.53	99.99	91.29	80.79	99.99
Kassala Town	66.67	12.38	100.00	84.26	62.62	100.00	87.57	69.73	97.12	89,04	73,41	100,00
Refi Kassla	90.91	62.50	100.00	88.57	74.27	98.72	89.00	80.77	94.50	95,00	87,62	99,18

TABLE 58: Carers' circumcision (FGM) for 15-19 years, 20-24 years, 25-29 years and 30-34 years of age by locality and by state

Location	15 - 19 years of age %			20 - 24 years of age %			25 - 29 years of age %			30 - 34 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Western Kassala	90.16	75.77	98.65	90.43	79.58	97.40	90.06	81.54	96.67	93,90	83,33	100,00
New Halfa	86.96	62.78	100.00	94.38	82.12	100.00	94.02	81.86	99.05	93,92	87,39	98,54
Refi Nahr Atbara	96.00	84.09	100.00	83.56	72.09	93.97	90.70	78.75	98.10	96,10	80,76	100,00
Rural Khashm Elgirba	100.00	85.69	100.00	93.14	73.79	100.00	92.06	70.59	100.00	93,28	77,94	100,00
Rural Wad Elhilaiw	56.60	27.24	86.24	71.19	49.93	88.67	64.02	47.14	82.64	68,32	45,95	87,40
Rural Aroma	100.00	100.00	100.00	98.82	93.23	100.00	95.12	90.08	99.15	97,10	90,13	100,00
Refi North Delta	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	98,55	92,40	100,00
Refi Hamashkureib	90.91	70.96	100.00	99.01	94.18	100.00	100.00	100.00	100.00	100,00	100,00	100,00
Rural Telkok	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100,00	100,00	100,00
Kassala State	87.73	63.36	99.99	91.75	78.95	99.99	92.38	82.67	99.99	94.1	84.18	99.99
Gedaref Town	92.59	63.53	100.00	80.17	64.46	92.39	68.64	47.58	87.35	78,49	62,19	90,33
Middle Geddaref	80.00	53.82	95.00	86.84	71.07	97.58	88.11	74.64	96.80	91,09	79,01	98,74
Elbutana	100.00	91.82	100.00	93.00	81.01	100.00	98.12	89.04	100.00	98,23	92,38	100,00
El Fashaga	80.00	47.83	100.00	65.56	43.27	83.25	71.26	52.74	84.43	81,01	64,99	92,66
El Rahad	17.14	0.00	42.34	20.18	7.17	34.44	24.48	11.37	39.78	23,17	11,11	41,70
Gala-a El Nahal	82.35	53.32	100.00	58.88	42.84	74.45	61.54	44.52	76.32	81,82	61,65	96,00
El Fao	64.38	44.89	83.80	66.12	55.23	75.83	55.80	41.61	67.05	57,89	39,79	79,23
El Qureisha	65.00	32.34	100.00	81.75	62.82	94.93	56.12	36.61	77.03	73,96	54,05	86,73
El Mafaza	75.68	38.03	97.06	39.84	19.38	63.18	40.36	23.03	58.06	51,59	34,17	69,92
Basunda	72.73	45.00	96.01	60.92	41.44	79.50	62.26	43.91	78.70	62,50	32,99	86,67
Western Galabat	84.85	56.80	100.00	90.00	77.32	97.59	88.44	77.16	97.15	90,59	79,70	97,65
Eastern Galabat	48.00	18.78	84.67	63.70	42.97	83.59	59.62	44.20	73.27	57,43	36,36	77,93
Al-Gadarif State	69.55	43.65	95.45	64.03	47.65	80.42	60.47	44.20	76.73	66.53	48.7	84.36
Sheikan	100.00	91.64	100.00	94.79	90.21	98.44	97.44	94.20	99.40	96,46	92,78	99,08
Um Rawaba	100.00	100.00	100.00	97.01	92.99	100.00	98.33	95.69	100.00	100,00	100,00	100,00
Um Dam Haj Ahmed	100.00	100.00	100.00	98.08	90.91	100.00	97.84	93.59	100.00	100,00	100,00	100,00
El Rahad	100.00	100.00	100.00	94.95	85.68	100.00	100.00	96.97	100.00	100,00	95,24	100,00
Bara	100.00	100.00	100.00	100.00	97.96	100.00	95.90	90.59	99.30	99,14	91,66	100,00
Gharb Bara	100.00	84.98	100.00	94.39	86.73	100.00	98.04	94.64	100.00	100,00	95,95	100,00
Soudari	94.55	85.00	100.00	98.20	94.93	100.00	98.43	95.15	100.00	96,67	88,33	100,00
Gebrat El Sheikh	100.00	100.00	100.00	100.00	97.55	100.00	100.00	97.57	100.00	100,00	96,18	100,00
North Kordofan State	99.28	95.42	99.99	96.95	92.74	99.99	98.15	95.53	99.99	98.6	95.61	99.99

TABLE 58: Carers' circumcision (FGM) for 15-19 years, 20-24 years, 25-29 years and 30-34 years of age by locality and by state

Location	15 - 19 years of age %			20 - 24 years of age %			25 - 29 years of age %			30 - 34 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kadugli	62.16	39.21	82.88	83.41	73.79	92.14	92.13	86.99	96.41	94,95	89,72	98,51
Reif Shargi	74.42	58.54	91.50	87.85	75.65	96.85	95.73	88.03	100.00	89,52	80,16	96,65
Dilling	50.00	14.25	81.25	50.88	23.06	72.58	49.15	22.27	75.57	47,17	19,67	81,16
El Quoz	81.25	58.62	96.88	89.17	80.89	95.40	89.36	80.13	96.46	100,00	95,92	100,00
Habila	67.86	45.00	86.21	86.15	71.56	95.28	92.75	88.19	96.65	87,14	77,10	96,35
Abassiya	85.71	59.94	100.00	93.23	85.38	98.33	95.00	88.97	99.32	89,47	79,61	97,41
El Rashad	95.45	79.16	100.00	62.24	34.25	89.89	73.03	52.54	90.40	76,92	53,04	92,61
Abu Jubaiha	100.00	93.17	100.00	97.60	93.00	100.00	94.27	89.81	97.84	93,48	87,03	99,00
El Tadamon	84.21	52.79	97.62	84.03	67.29	94.87	85.71	70.95	94.63	90,00	77,20	97,65
Talodi	60.00	35.71	84.76	95.45	75.76	100.00	100.00	83.66	100.00	100,00	54,55	100,00
Ghadeer	100.00	78.94	100.00	97.37	90.32	100.00	100.00	97.70	100.00	96,49	87,50	100,00
El Leri	98.70	91.65	100.00	97.85	92.08	100.00	96.84	92.56	99.39	100,00	100,00	100,00
Abu Karshola	94.74	78.05	100.00	97.84	93.31	100.00	100.00	95.89	100.00	95,00	85,36	100,00
Delami	42.86	5.26	81.89	48.75	19.19	84.62	60.00	26.98	85.08	45,71	24,11	70,54
South Kordofan State	81.30	62.50	99.99	85.82	73.43	98.20	87.69	75.89	99.49	87.37	72.66	99.99
Abu Zabad	90.00	68.85	100.00	96.12	90.21	100.00	100.00	98.29	100.00	99,17	94,99	100,00
ElKhiwai	100.00	100.00	100.00	97.50	93.02	100.00	98.54	94.33	100.00	100,00	100,00	100,00
Ghubaish	93.75	80.00	100.00	96.63	90.91	100.00	90.91	84.47	96.13	98,15	92,78	100,00
El Nuhud	97.78	89.08	100.00	95.72	89.79	99.38	94.38	89.65	98.29	95,40	90,91	98,88
El Idia	100.00	88.45	100.00	96.64	90.75	100.00	93.92	88.95	98.47	97,98	93,07	100,00
Wad Benda	100.00	100.00	100.00	98.67	95.02	100.00	100.00	100.00	100.00	100,00	97,82	100,00
Lagawa	100.00	75.00	100.00	93.10	82.59	99.10	100.00	97.64	100.00	95,00	84,81	100,00
Elsunut	95.24	76.46	100.00	95.33	90.32	100.00	97.50	91.33	100.00	97,18	87,09	100,00
Keilik	84.62	69.38	96.58	99.11	93.65	100.00	100.00	97.11	100.00	92,86	82,08	100,00
Es Salam	86.57	72.56	96.09	85.79	79.13	92.97	85.31	78.62	90.87	90,70	83,57	95,91
Babanusa	94.44	76.47	100.00	98.48	94.62	100.00	100.00	96.34	100.00	100,00	95,45	100,00
Abyei	87.50	65.58	100.00	97.46	92.39	100.00	96.75	91.49	100.00	100,00	100,00	100,00
El Dibab	100.00	50.00	100.00	100.00	74.85	100.00	79.66	62.09	95.19	85,71	59,24	100,00
El Meiram	24.14	0.00	73.09	57.14	30.00	86.45	58.18	43.59	72.93	55,88	36,35	77,44
West Kordofan State	92.17	75.10	99.99	94.46	86.75	99.99	93.62	87.11	99.99	94.9	87.04	99.99
El Fasher	82.19	68.05	94.29	87.54	79.32	94.32	88.92	81.88	93.92	89,14	82,23	94,44
Tawila	21.05	0.00	50.00	35.14	19.51	56.21	31.25	14.34	52.16	46,74	27,62	63,39
Melit	100.00	85.65	100.00	93.88	87.25	98.89	95.04	90.05	98.73	96,59	86,25	100,00
Um Kadada	86.27	69.55	96.82	96.24	90.91	100.00	92.51	87.50	97.05	99,32	95,53	100,00
Kebkabiya	38.64	20.75	60.76	52.27	40.30	63.17	52.00	42.29	60.53	44,74	29,53	61,12

TABLE 58: Carers' circumcision (FGM) for 15-19 years, 20-24 years, 25-29 years and 30-34 years of age by locality and by state

Location	15 - 19 years of age %			20 - 24 years of age %			25 - 29 years of age %			30 - 34 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kutum	85.71	56.22	100.00	80.95	56.66	96.52	87.36	68.20	98.11	85,09	71,19	95,83
El Mahalha	95.24	74.95	100.00	90.54	77.53	98.51	96.72	88.23	100.00	98,25	90,47	100,00
Saraf Omra	56.00	34.21	76.94	61.07	44.06	76.83	55.97	39.97	73.10	52,27	28,16	72,86
El Serief	95.24	88.46	100.00	95.69	88.64	99.35	95.73	91.11	99.41	95,18	87,18	100,00
Dar Elsalam	80.00	45.40	100.00	57.32	36.62	75.84	71.85	44.53	92.64	60,00	30,32	85,92
Kelemando	100.00	84.62	100.00	95.05	89.72	99.05	95.28	90.82	98.86	96,94	90,78	100,00
El Tawisha	82.93	66.67	95.65	95.41	89.24	99.21	94.44	88.27	98.40	99,04	94,38	100,00
Um Baru	100.00	100.00	100.00	98.63	90.00	100.00	100.00	94.11	100.00	100,00	100,00	100,00
El Lait	85.71	58.27	100.00	86.08	76.90	92.51	93.55	88.38	97.77	95,24	87,98	99,06
ELkuma	50.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100,00	91,98	100,00
El Tina	NA	NA	NA	100.00	100.00	100.00	100.00	100.00	100.00	66,67	0,00	100,00
Kernoi	81.25	60.36	95.18	86.81	77.68	92.67	89.29	80.43	96.94	79,66	68,17	89,48
North Darfur State	75.33	45.31	99.99	82.14	70.43	93.85	83.85	73.36	94.35	81.35	62.71	99.98
Nyala South	94.87	83.60	100.00	98.15	93.02	100.00	91.56	85.66	97.27	100,00	94,68	100,00
Nyala North	33.33	0.00	100.00	84.21	54.48	95.75	88.24	68.62	100.00	100,00	80,77	100,00
Es Salam	93.06	84.41	98.63	96.84	83.99	100.00	92.70	85.71	97.11	94,12	80,41	100,00
El Wihda	94.44	75.00	100.00	89.04	79.73	96.44	91.67	80.53	100.00	89,47	75,42	100,00
Mershing	96.47	86.15	100.00	94.87	89.55	98.69	95.00	86.43	99.36	95,19	87,81	100,00
Beliel	80.95	69.69	91.54	92.59	86.91	97.24	91.48	86.36	96.48	93,08	85,23	98,69
Nitega	90.91	69.55	100.00	95.83	88.60	100.00	97.80	92.77	100.00	94,59	88,36	100,00
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,00	0,00	0,00
Kas	82.86	56.80	97.84	93.16	76.65	100.00	89.66	77.14	98.73	86,32	71,65	95,39
Shattaya	52.50	26.16	80.41	69.77	49.97	85.84	60.99	38.88	80.32	75,38	57,86	91,69
Buram	75.00	47.89	93.37	76.47	65.17	86.52	86.03	78.30	92.16	90,91	79,75	98,69
Gereida	88.00	55.56	100.00	87.18	73.73	94.02	89.44	73.04	97.56	86,61	70,75	98,00
El Sunta	100.00	100.00	100.00	100.00	100.00	100.00	100.00	97.48	100.00	100,00	92,45	100,00
El Radoum	100.00	100.00	100.00	97.14	91.56	100.00	94.93	88.82	99.28	95,05	88,61	99,12
Tulus	NA	NA	NA	53.85	18.56	100.00	50.59	2.11	92.32	30,77	0,00	76,97
Damso	56.76	21.83	91.30	48.44	22.84	72.57	48.96	25.46	69.50	54,12	25,27	76,42
Ed Elfursan	100.00	87.08	100.00	91.76	84.49	97.73	87.82	77.85	95.17	80,68	68,96	91,25
Kubum	90.24	82.96	96.01	82.67	72.14	92.50	87.22	80.68	93.18	95,29	89,39	98,84
Kateila	100.00	86.96	100.00	93.06	85.29	98.94	94.00	86.04	98.67	95,08	86,67	100,00
Rehaid Elbirdi	83.61	64.77	95.95	79.73	59.81	93.62	81.91	67.04	94.52	86,96	74,69	95,71
Um Dafoug	100.00	100.00	100.00	98.44	92.30	100.00	94.92	87.50	100.00	100,00	94,74	100,00

TABLE 58: Carers' circumcision (FGM) for 15-19 years, 20-24 years, 25-29 years and 30-34 years of age by locality and by state

Location	15 - 19 years of age %			20 - 24 years of age %			25 - 29 years of age %			30 - 34 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Darfur State	80.03	51.84	99.99	84.24	66.33	99.99	83.67	66.60	99.99	84.22	67.48	99.99
Abu Jabra	100.00	100.00	100.00	100.00	96.14	100.00	98.56	92.58	100.00	100,00	96,46	100,00
Abu Karinka	100.00	89.16	100.00	97.03	91.85	100.00	95.52	88.81	100.00	94,23	84,20	100,00
Bahr El Arab	100.00	87.50	100.00	95.29	84.93	100.00	96.67	90.57	100.00	95,38	85,23	100,00
Adila	75.00	52.25	94.75	64.89	55.00	73.89	66.86	56.28	77.32	50,88	41,56	61,89
Ed Dain	100.00	85.71	100.00	96.08	89.87	100.00	97.73	92.84	100.00	100,00	96,55	100,00
Assalaya	100.00	91.99	100.00	97.38	93.18	100.00	94.48	87.58	98.90	96,84	88,74	100,00
El Firdous	100.00	100.00	100.00	98.21	91.41	100.00	98.17	93.33	100.00	97,06	88,98	100,00
Shia-ria	100.00	100.00	100.00	97.01	88.89	100.00	95.38	90.00	99.19	100,00	91,30	100,00
Yassin	100.00	88.87	100.00	98.52	94.63	100.00	96.43	90.90	99.33	97,27	91,95	100,00
East Darfur State	96.89	88.75	99.99	93.26	86.87	99.64	92.87	86.98	98.75	91.56	84.51	98.6
El Geneina	44.44	27.07	63.90	58.75	45.44	72.07	54.79	42.68	68.93	52,73	39,12	66,88
Habila	22.22	0.00	56.52	41.28	20.72	59.89	38.92	21.06	59.72	40,57	23,69	58,90
Kulbus	45.16	22.40	65.87	53.60	33.94	74.38	40.00	24.35	54.39	51,19	23,68	72,90
Beida	66.67	31.79	93.75	39.22	23.24	56.90	41.49	24.71	59.88	28,72	10,58	51,22
Foro Baranga	39.58	19.14	61.83	29.58	16.50	48.20	32.45	17.40	49.07	27,55	10,58	51,07
Kereneik	11.36	2.38	26.67	27.24	15.79	39.28	27.27	16.86	39.70	25,16	14,92	35,69
Sirba	12.50	0.00	26.95	26.32	11.75	42.67	13.64	4.24	27.70	11,19	0,98	28,28
Jebel Moon	36.36	0.00	75.00	45.45	19.72	71.45	53.78	36.04	70.50	65,91	46,61	81,36
West Darfur State	36.66	13.48	59.83	44.71	27.25	62.17	40.92	26.70	55.15	41.73	23.43	60.02
Zalingi	24.29	6.81	42.91	51.85	37.31	66.23	47.55	33.24	59.23	47,74	33,15	61,87
Wadi Salih	32.31	14.07	49.16	33.47	18.52	49.78	33.16	19.22	48.54	37,10	19,44	54,00
Mukjar	29.41	10.68	58.36	43.62	23.75	62.77	53.06	38.72	64.54	42,53	23,36	63,05
Central Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.72	0,00	0,00	0,00
North Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,00	0,00	0,00
Bendasi	94.74	64.67	100.00	88.24	74.57	100.00	92.08	72.65	100.00	74,42	58,57	88,25
Nertiti	6.98	0.00	33.41	16.03	2.22	35.26	15.96	3.69	31.78	13,33	4,18	29,82
Azum	17.86	0.00	45.52	30.91	17.96	43.42	18.58	7.61	35.30	34,88	16,00	53,74
Um Dukhun	50.82	32.14	69.51	63.24	46.21	76.46	66.28	52.37	79.15	55,56	36,45	75,00
Central Darfur State	28.14	10.60	45.67	35.61	21.79	49.44	36.18	24.22	48.13	33.55	18.84	48.26

TABLE 59: Carers' circumcision (FGM) for 35-39 years, 40-44 years, 45-49 years and 50-34 years of age or older by state and national

State	35 – 39 years of age %			40 – 44 years of age %			45 – 49 years of age %			50 years or older %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	67.56	48.82	86.29	68.45	42.16	94.75	80.17	34.80	99.99	38.66	0.01	99.28
Al-Gazeera	85.66	71.93	99.38	85.82	63.69	99.99	76.81	43.16	99.99	75.73	15.15	99.99
Blue Nile	73.61	58.32	88.90	77.29	51.23	99.99	78.15	40.06	99.99	20.94	0.01	78.36
Central Darfur	32.25	17.64	46.87	39.58	10.94	68.21	44.21	18.17	70.25	21.66	0.01	76.49
East Darfur	94.33	87.21	99.99	97.09	86.10	99.99	91.16	51.77	99.99	75.58	46.72	99.99
Kassala	93.23	82.98	99.99	93.98	78.36	99.99	99.13	87.81	99.99	72.87	72.87	72.87
Khartoum	84.87	69.81	99.93	84.64	65.08	99.99	96.67	54.43	99.99	63.28	63.28	63.28
North Darfur	84.94	65.73	99.99	88.65	70.93	99.99	86.95	44.76	99.99	70.67	45.34	96.01
North Kordofan	97.41	93.33	99.99	98.54	92.25	99.99	100.00	100.00	100.00	93.36	93.36	93.36
Northern	98.34	93.89	99.99	100.00	91.88	99.99	93.98	76.52	99.99	56.69	56.69	56.69
Red Sea	88.06	54.01	99.99	91.46	66.69	99.99	57.07	1.29	99.99	40.00	40.00	40.00
River Nile	96.19	90.55	99.99	99.27	96.10	99.99	100.00	100.00	100.00	97.58	97.58	97.58
Sennar	94.02	85.70	99.99	93.31	72.02	99.99	100.00	82.37	99.99	74.95	59.61	90.30
South Darfur	85.81	64.90	99.99	81.68	51.15	99.99	79.59	28.77	99.99	65.00	26.55	99.99
South Kordofan	91.50	77.82	99.99	86.64	55.11	99.99	84.45	58.20	99.99	57.85	37.51	78.19
West Darfur	48.64	28.99	68.28	42.23	9.89	74.57	39.57	0.01	83.35	22.59	0.01	95.75
West Kordofan	95.07	87.45	99.99	93.83	77.06	99.99	92.72	74.68	99.99	58.37	33.74	82.99
White Nile	91.22	81.87	99.99	92.19	72.38	99.99	84.41	59.09	99.99	89.44	55.72	99.99
Sudan	85.37	69.82	99.99	85.76	64.34	99.99	85.22	49.25	99.99	65.32	29.58	99.99

TABLE 60: Carers' circumcision (FGM) for 35-39 years, 40-44 years, 45-49 years and 50-34 years of age or older by locality

Location	35 – 39 years of age %			40 – 44 years of age %			45 – 49 years of age %			50 years or older %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	97.16	92.42	100.00	100.00	92.59	100.00	88.89	61.46	100.00	100.00	100.00	100.00
El Golid	97.44	91.56	100.00	100.00	72.69	100.00	66.67	33.33	100.00	100.00	100.00	100.00
Merwoe	98.48	92.64	100.00	100.00	81.82	100.00	100.00	100.00	100.00	NA	NA	NA
El Daba	97.83	89.15	100.00	100.00	77.75	100.00	100.00	66.67	100.00	NA	NA	NA
Halfa	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Delgo	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Burgaig	100.00	96.39	100.00	100.00	85.16	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Northern State	98.34	93.89	99.99	100.00	91.88	99.99	93.98	76.52	99.99	56.69	56.69	56.69
El Matama	100.00	94.50	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 60: Carers' circumcision (FGM) for 35-39 years, 40-44 years, 45-49 years and 50-34 years of age or older by locality

Location	35 – 39 years of age %			40 – 44 years of age %			45 – 49 years of age %			50 years or older %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Shendi	96.20	89.63	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Abu Hamad	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Barbar	96.23	83.90	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Damar	92.99	86.63	97.73	97.06	87.72	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Atbara	91.34	83.07	98.00	100.00	90.31	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Buhaira	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
River Nile State	96.19	90.55	99.99	99.27	96.10	99.99	100.00	100.00	100.00	97.58	97.58	97.58
Khartoum	93.62	85.85	98.06	100.00	94.28	100.00	83.33	37.50	100.00	100.00	100.00	100.00
Bahri	94.94	87.27	100.00	64.44	29.86	91.57	100.00	100.00	100.00	100.00	100.00	100.00
Um Durman	98.10	93.33	100.00	90.70	78.56	100.00	100.00	0.00	100.00	100.00	100.00	100.00
Um Bada	62.10	40.91	87.53	84.21	52.07	100.00	100.00	100.00	100.00	NA	NA	NA
Jebel Awlia	71.64	51.38	90.40	81.82	53.32	100.00	100.00	25.00	100.00	0.00	0.00	0.00
Sharg Elneel	93.75	83.90	100.00	85.00	58.05	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Karrari	96.43	88.42	100.00	88.64	70.19	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Khartoum State	84.87	69.81	99.93	84.64	65.08	99.99	96.67	54.43	99.99	63.28	63.28	63.28
Greater Medani	88.28	75.71	96.80	79.17	54.55	100.00	70.00	30.00	100.00	100.00	100.00	100.00
Ganub Elgazira	86.96	69.23	97.27	84.85	56.75	100.00	66.67	16.25	100.00	75.00	0.00	100.00
El Hassahisa	87.91	75.76	95.97	75.00	50.00	96.00	87.50	49.81	100.00	33.33	0.00	100.00
El Kamlin	75.00	51.39	93.64	76.92	41.65	100.00	71.88	39.05	94.74	NA	NA	NA
Sharg El Gezira	93.10	75.60	100.00	100.00	85.68	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Um Elqura	95.79	81.25	100.00	89.47	56.20	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Manaqil	80.00	62.62	92.31	86.21	56.66	100.00	60.00	19.91	100.00	100.00	0.00	100.00
El Qurashi	88.35	73.25	97.35	97.06	79.96	100.00	92.31	71.97	100.00	100.00	100.00	100.00
Al-Gazeera State	85.66	71.93	99.38	85.82	63.69	99.99	76.81	43.16	99.99	75.73	15.15	99.99
Sennar	98.93	94.32	100.00	100.00	90.18	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Sharg Sennar	87.07	73.90	95.70	92.00	59.86	100.00	100.00	100.00	100.00	100.00	0.00	100.00
Sinja	99.34	95.65	100.00	88.89	73.16	98.09	100.00	100.00	100.00	100.00	100.00	100.00
Abu Hujar	95.92	84.58	100.00	100.00	83.23	100.00	100.00	100.00	100.00	NA	NA	NA
El Dali	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Es Suki	84.78	69.20	96.04	78.95	50.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ed Dinder	97.92	84.42	100.00	100.00	25.00	100.00	100.00	0.00	100.00	NA	NA	NA
Sennar State	94.02	85.70	99.99	93.31	72.02	99.99	100.00	82.37	99.99	74.95	59.61	90.30
Ed Damazine	90.00	80.40	97.14	93.10	72.29	100.00	72.73	30.73	100.00	40.00	0.00	100.00
El Tadamon	100.00	88.31	100.00	100.00	57.29	100.00	NA	NA	NA	NA	NA	NA
El Roseiris	67.57	50.59	80.99	56.67	27.00	83.41	80.00	25.00	100.00	0.00	0.00	100.00
Baw	61.11	42.40	75.52	48.00	17.60	75.00	100.00	100.00	100.00	0.00	0.00	0.00
Geisan	62.30	35.96	83.06	100.00	100.00	100.00	66.67	0.00	100.00	20.00	0.00	100.00

TABLE 60: Carers' circumcision (FGM) for 35-39 years, 40-44 years, 45-49 years and 50-34 years of age or older by locality

Location	35 – 39 years of age %			40 – 44 years of age %			45 – 49 years of age %			50 years or older %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Kurmuk	100.00	93.53	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Wad El Mahi	36.36	14.75	57.71	66.67	0.00	100.00	100.00	33.33	100.00	0.00	0.00	100.00
Blue Nile State	73.61	58.32	88.90	77.29	51.23	99.99	78.15	40.06	99.99	20.94	0.01	78.36
Kosti	82.61	67.14	95.72	88.57	67.86	100.00	100.00	100.00	100.00	100.00	0.00	100.00
Guli	97.37	90.10	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Tendalti	83.72	72.41	91.67	52.94	0.00	100.00	37.50	0.00	100.00	33.33	0.00	100.00
Es Salam	100.00	95.73	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Rabak	80.70	65.37	92.37	85.45	64.55	98.39	15.38	0.00	64.04	57.14	0.00	100.00
El Jabalain	97.25	92.22	100.00	100.00	82.35	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Diwaim	100.00	98.50	100.00	100.00	92.00	100.00	100.00	66.67	100.00	100.00	100.00	100.00
Um Rimta	98.98	94.62	100.00	100.00	100.00	100.00	96.00	72.70	100.00	100.00	100.00	100.00
El Gitaina	94.32	86.27	99.09	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
White Nile State	91.22	81.87	99.99	92.19	72.38	99.99	84.41	59.09	99.99	89.44	55.72	99.99
Port Sudan	77.50	55.11	93.81	80.49	55.52	100.00	66.67	0.00	100.00	100.00	100.00	100.00
Swakin	80.36	64.76	93.35	100.00	96.14	100.00	100.00	0.00	100.00	NA	NA	NA
El Gonob Welawlaib	100.00	91.10	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Sinkat	97.73	86.43	100.00	100.00	100.00	100.00	0.00	0.00	0.00	100.00	100.00	100.00
Haya	100.00	81.82	100.00	100.00	100.00	100.00	NA	NA	NA	NA	NA	NA
Dordieb	97.87	88.87	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
Tokar	96.83	86.65	100.00	100.00	100.00	100.00	66.67	0.00	100.00	NA	NA	NA
Agig	85.71	73.68	95.08	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
Gabaot Elma-aadin	79.55	57.77	95.75	80.00	0.00	100.00	100.00	62.50	100.00	NA	NA	NA
Halaeeb (accessible parts)	NA	NA	NA	NA	NA	NA	100.00	100.00	100.00	NA	NA	NA
Red Sea State	88.06	54.01	99.99	91.46	66.69	99.99	57.07	1.29	99.99	40.00	40.00	40.00
Kassala Town	88.50	71.40	100.00	78.72	47.76	96.26	100.00	100.00	100.00	100.00	100.00	100.00
Refi Kassla	86.36	72.22	96.43	100.00	94.85	100.00	90.00	66.67	100.00	100.00	100.00	100.00
Rural Western Kassala	92.75	79.99	100.00	100.00	77.78	100.00	100.00	100.00	100.00	0.00	0.00	0.00
New Halfa	96.70	87.95	100.00	100.00	83.33	100.00	100.00	0.00	100.00	NA	NA	NA
Refi Nahr Atbara	91.25	79.48	98.16	86.67	50.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Rural Khashm Elgirba	92.86	72.56	100.00	90.91	53.79	100.00	100.00	100.00	100.00	NA	NA	NA
Rural Wad Elhilaiw	68.82	47.60	86.80	84.31	59.19	100.00	100.00	100.00	100.00	0.00	0.00	0.00
Rural Aroma	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Refi North Delta	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 60: Carers' circumcision (FGM) for 35-39 years, 40-44 years, 45-49 years and 50-34 years of age or older by locality

Location	35 – 39 years of age %			40 – 44 years of age %			45 – 49 years of age %			50 years or older %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi Hamashkureib	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Rural Telkok	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Kassala State	93.23	82.98	99.99	93.98	78.36	99.99	99.13	87.81	99.99	72.87	72.87	72.87
Gedaref Town	83.59	68.02	94.60	62.50	33.87	92.02	100.00	26.67	100.00	66.67	0.00	100.00
Middle Geddaref	91.25	82.71	97.50	95.83	78.56	100.00	100.00	0.00	100.00	0.00	0.00	100.00
Elbutana	100.00	87.28	100.00	100.00	77.71	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Fashaga	73.86	50.00	92.00	60.00	31.79	88.00	66.67	0.00	100.00	50.00	0.00	100.00
El Rahad	39.34	16.67	61.78	30.00	10.23	60.00	33.33	0.00	100.00	0.00	0.00	0.00
Gala-a El Nahal	83.95	68.49	95.12	87.50	45.45	100.00	100.00	25.00	100.00	NA	NA	NA
El Fao	68.60	57.89	81.55	83.33	49.89	100.00	91.30	59.97	100.00	0.00	0.00	0.00
El Qureisha	73.53	45.27	95.25	84.62	51.90	100.00	44.44	5.59	92.34	69.05	0.00	100.00
El Mafaza	36.00	11.31	70.95	55.00	23.30	88.24	50.00	0.00	100.00	100.00	100.00	100.00
Basunda	61.90	39.60	80.24	50.00	21.87	81.09	100.00	42.43	100.00	0.00	0.00	0.00
Western Galabat	81.32	69.23	91.69	80.95	46.86	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Eastern Galabat	58.76	41.04	75.93	88.46	63.96	100.00	100.00	50.00	100.00	NA	NA	NA
Al-Gadarif State	67.56	48.82	86.29	68.45	42.16	94.75	80.17	34.80	99.99	38.66	0.01	99.28
Sheikan	91.41	84.85	96.68	100.00	94.87	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Um Rawaba	99.37	96.77	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Um Dam Haj Ahmed	100.00	94.99	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
El Rahad	100.00	100.00	100.00	86.96	63.16	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Bara	96.10	89.12	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Gharb Bara	100.00	93.47	100.00	94.64	82.50	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Soudari	100.00	98.18	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Gebrat El Sheikh	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
North Kordofan State	97.41	93.33	99.99	98.54	92.25	99.99	100.00	100.00	100.00	93.36	93.36	93.36
Kadugli	91.30	82.80	97.76	89.19	72.43	100.00	90.91	50.00	100.00	100.00	100.00	100.00
Reif Shargi	97.65	89.33	100.00	100.00	71.43	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Dilling	69.39	31.36	94.16	59.41	0.00	100.00	40.00	0.00	100.00	0.00	0.00	0.00
El Quoz	98.33	91.66	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
Habila	98.73	93.33	100.00	100.00	90.31	100.00	100.00	100.00	100.00	NA	NA	NA
Abassiya	88.16	77.77	97.47	100.00	79.93	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Rashad	88.37	66.67	98.68	53.12	25.88	87.01	20.00	0.00	70.11	100.00	100.00	100.00
Abu Jubaiha	100.00	95.52	100.00	90.00	33.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Tadamon	78.00	60.00	93.47	52.38	24.51	84.01	100.00	28.57	100.00	75.00	0.00	100.00
Talodi	100.00	62.48	100.00	100.00	0.00	100.00	0.00	0.00	0.00	NA	NA	NA

TABLE 60: Carers' circumcision (FGM) for 35-39 years, 40-44 years, 45-49 years and 50-34 years of age or older by locality

Location	35 – 39 years of age %			40 – 44 years of age %			45 – 49 years of age %			50 years or older %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ghadeer	100.00	90.69	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Leri	97.73	90.16	100.00	100.00	83.30	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Abu Karshola	97.75	86.51	100.00	100.00	75.00	100.00	100.00	100.00	100.00	NA	NA	NA
Delami	54.10	21.60	83.59	73.33	38.41	100.00	0.00	0.00	0.00	0.00	0.00	0.00
South Kordofan State	91.50	77.82	99.99	86.64	55.11	99.99	84.45	58.20	99.99	57.85	37.51	78.19
Abu Zabad	98.53	91.46	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
ElKhiwai	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	100.00
Ghubaish	97.26	90.26	100.00	90.91	66.67	100.00	100.00	100.00	100.00	0.00	0.00	0.00
El Nuhud	95.65	86.18	100.00	100.00	77.78	100.00	100.00	62.50	100.00	100.00	100.00	100.00
El Idia	100.00	93.48	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Wad Benda	98.84	94.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Lagawa	100.00	100.00	100.00	100.00	100.00	100.00	100.00	59.86	100.00	63.96	24.13	100.00
Elsunut	94.23	83.33	100.00	95.00	74.96	100.00	NA	NA	NA	NA	NA	NA
Keilik	100.00	93.86	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Es Salam	92.53	85.11	97.49	86.96	73.68	96.31	100.00	100.00	100.00	100.00	100.00	100.00
Babanusa	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
Abyei	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
El Dibab	91.18	70.00	100.00	92.31	58.33	100.00	100.00	0.00	100.00	100.00	100.00	100.00
El Meiram	47.92	29.97	72.74	11.11	0.00	100.00	100.00	100.00	100.00	NA	NA	NA
West Kordofan State	95.07	87.45	99.99	93.83	77.06	99.99	92.72	74.68	99.99	58.37	33.74	82.99
El Fasher	86.97	80.16	93.41	89.76	79.43	96.97	85.00	60.86	100.00	100.00	100.00	100.00
Tawila	32.69	11.51	58.59	10.00	0.00	41.20	20.00	0.00	83.33	0.00	0.00	0.00
Melit	97.22	89.31	100.00	92.86	71.43	100.00	80.00	30.00	100.00	100.00	100.00	100.00
Um Kadada	98.92	93.96	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
Kebkabiya	66.04	36.70	84.65	80.00	35.60	100.00	100.00	0.00	100.00	100.00	100.00	100.00
Kutum	98.31	91.07	100.00	90.48	66.67	100.00	100.00	100.00	100.00	83.33	19.83	100.00
El Mahalha	91.18	74.07	100.00	100.00	83.28	100.00	100.00	16.50	100.00	0.00	0.00	100.00
Saraf Omra	64.29	36.35	84.45	100.00	40.00	100.00	100.00	0.00	100.00	NA	NA	NA
El Serief	93.59	86.35	100.00	100.00	90.38	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Dar Elsalam	78.49	50.65	95.67	100.00	91.30	100.00	36.36	0.00	87.50	100.00	100.00	100.00
Kelemando	97.96	92.55	100.00	100.00	77.78	100.00	100.00	84.58	100.00	100.00	100.00	100.00
El Tawisha	96.74	88.99	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	83.33	100.00
Um Baru	100.00	92.31	100.00	100.00	88.87	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Lait	87.18	70.45	97.83	65.22	30.77	88.27	100.00	100.00	100.00	100.00	100.00	100.00
ELkuma	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00	100.00	NA	NA	NA
El Tina	75.00	0.00	100.00	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 60: Carers' circumcision (FGM) for 35-39 years, 40-44 years, 45-49 years and 50-34 years of age or older by locality

Location	35 – 39 years of age %			40 – 44 years of age %			45 – 49 years of age %			50 years or older %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kernoi	85.71	77.83	93.11	100.00	100.00	100.00	100.00	83.30	100.00	100.00	100.00	100.00
North Darfur State	84.94	65.73	99.99	88.65	70.93	99.99	86.95	44.76	99.99	70.67	45.34	96.01
Nyala South	94.35	87.97	99.32	80.00	33.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Nyala North	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
Es Salam	94.20	78.11	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Wihda	61.90	44.73	80.71	84.62	40.00	100.00	100.00	100.00	100.00	80.00	0.00	100.00
Mershing	90.79	79.40	98.53	91.30	63.53	100.00	37.50	0.00	100.00	100.00	100.00	100.00
Beliel	91.11	84.34	95.87	97.37	87.48	100.00	100.00	33.33	100.00	100.00	50.00	100.00
Nitega	100.00	96.35	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA
Kas	94.57	85.04	99.22	85.71	60.86	100.00	100.00	85.68	100.00	0.00	0.00	100.00
Shattaya	80.41	61.87	94.23	62.50	19.91	91.67	70.71	0.00	100.00	100.00	100.00	100.00
Buram	79.43	67.58	89.19	91.30	63.64	100.00	100.00	66.67	100.00	100.00	100.00	100.00
Gereida	93.65	81.93	100.00	95.00	78.25	100.00	83.33	33.17	100.00	100.00	100.00	100.00
El Sunta	95.56	85.25	100.00	80.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Radoum	94.81	84.29	100.00	100.00	87.03	100.00	100.00	100.00	100.00	100.00	37.50	100.00
Tulus	44.83	0.00	100.00	13.33	0.00	100.00	20.00	0.00	100.00	83.33	0.00	100.00
Damso	80.00	39.97	100.00	33.33	0.00	100.00	0.00	0.00	0.00	NA	NA	NA
Ed Elfursan	83.08	73.80	90.33	90.70	70.56	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Kubum	97.60	90.24	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
Kateila	95.12	87.80	99.12	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Rehaid Elbirdi	77.08	60.60	92.63	100.00	100.00	100.00	20.00	0.00	100.00	100.00	100.00	100.00
Um Dafoug	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NA	NA	NA
South Darfur State	85.81	64.90	99.99	81.68	51.15	99.99	79.59	28.77	99.99	65.00	26.55	99.99
Abu Jabra	100.00	100.00	100.00	100.00	86.67	100.00	100.00	100.00	100.00	100.00	0.00	100.00
Abu Karinka	97.44	89.83	100.00	100.00	77.78	100.00	100.00	42.75	100.00	100.00	100.00	100.00
Bahr El Arab	100.00	87.86	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Adila	70.59	55.62	87.95	78.57	49.91	100.00	38.46	0.00	100.00	NA	NA	NA
Ed Dain	95.29	89.21	99.12	100.00	93.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Assalaya	92.45	83.87	98.18	96.77	83.73	100.00	100.00	100.00	100.00	100.00	100.00	100.00
El Firdous	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	100.00	NA	NA	NA
Shia-ria	98.70	92.86	100.00	100.00	88.45	100.00	81.67	20.00	100.00	60.00	0.00	100.00
Yassin	98.90	93.96	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
East Darfur State	94.33	87.21	99.99	97.09	86.10	99.99	91.16	51.77	99.99	75.58	46.72	99.99

TABLE 60: Carers' circumcision (FGM) for 35-39 years, 40-44 years, 45-49 years and 50-34 years of age or older by locality

Location	35 – 39 years of age %			40 – 44 years of age %			45 – 49 years of age %			50 years or older %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Geneina	64.97	47.89	78.71	52.50	28.18	72.34	40.00	0.00	100.00	0.00	0.00	100.00
Habila	36.21	11.41	62.15	39.01	0.00	77.84	44.44	0.00	80.97	66.67	0.00	100.00
Kulbus	54.00	33.31	75.94	46.15	9.95	84.62	11.11	0.00	60.00	0.00	0.00	0.00
Beida	50.00	16.65	83.43	66.67	14.20	100.00	NA	NA	NA	NA	NA	NA
Foro Baranga	26.25	10.61	47.30	21.05	0.00	53.35	0.00	0.00	100.00	100.00	100.00	100.00
Kereneik	28.99	16.24	42.40	29.73	10.48	54.26	25.00	0.00	77.89	33.33	0.00	100.00
Sirba	19.47	6.30	36.37	4.76	0.00	22.22	0.00	0.00	66.67	0.00	0.00	0.00
Jebel Moon	69.00	47.19	89.47	60.00	0.00	92.86	40.00	0.00	92.69	33.33	0.00	100.00
West Darfur State	48.64	28.99	68.28	42.23	9.89	74.57	39.57	0.01	83.35	22.59	0.01	95.75
Zalingi	40.10	25.84	55.33	38.46	14.29	63.33	85.71	0.00	100.00	22.22	0.00	100.00
Wadi Salih	39.39	20.91	58.58	NA	NA	NA	0.00	0.00	0.00	0.00	0.00	0.00
Mukjar	30.36	15.51	44.44	63.64	31.58	86.71	100.00	100.00	100.00	100.00	100.00	100.00
Central Jebel Mara	0.00	0.00	18.76	0.00	0.00	0.00	0.00	0.00	0.00	NA	NA	NA
North Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NA	NA	NA
Bendasi	77.19	63.74	91.68	92.31	61.46	100.00	100.00	100.00	100.00	NA	NA	NA
Nertiti	19.64	0.00	48.06	0.00	0.00	11.11	0.00	0.00	60.83	NA	NA	NA
Azum	25.93	12.90	46.16	16.67	0.00	52.01	100.00	100.00	100.00	NA	NA	NA
Um Dukhun	64.52	44.38	85.30	73.91	36.36	100.00	18.18	0.00	66.67	NA	NA	NA
Central Darfur State	32.25	17.64	46.87	39.58	10.94	68.21	44.21	18.17	70.25	21.66	0.01	76.49

3.10 Childhood illnesses and treatment-seeking behavior

3.10.1 Recognition of danger signs

Recognition of danger signs average results

According to the 2005 *Handbook: Integrated Management of Childhood Illness* (IMCI) by the WHO and UNICEF, children up to the age of 59 months are considered at high risk or in danger if they exhibit signs or symptoms such as: not feeding or poor suck; convulsions; drowsiness or weakness; or vomiting. Mothers are advised to watch out for these danger signs, and if they see any, to immediately seek care for their child with a health care provider. Other worrisome signs or symptoms that mothers are expected to recognize in their children include: bloody diarrhoea; fever; becoming progressively sicker; and difficulty breathing. These signs are just as important as the others for mothers to recognize and to seek care for; but on their own, they are not danger signs unless accompanied by one of the previous four signs. In the S3M II survey, carers of children were asked about their awareness of these danger signs. The mean number of danger signs identified by carers was 1.7 (95 per cent CI: 1.5-1.8) out of 5 signs. Among the states, carers identified the greatest number of danger signs in Blue Nile state, at 2.1

(95 per cent CI: 1.9-2.3) signs, while carers in Sennar state identified the least, at 1.4 (95 per cent CI: 1.2-1.5) signs *(see Figure 217)*.

Among the localities, El Tadamon and Baw localities, both in Blue Nile state, had the greatest number of signs identified by carers, at 2.82 (95 per cent CI: 2.64-3.01) and 2.53 (95 per cent CI: 2.16-2.86) respectively. Carers in these two localities identified a significantly higher number of danger signs than carers in all other localities. Carers in Kubum locality in South Darfur state identified the least number of danger signs, at 0.86 (95 per cent CI: 0.79-0.91) *(see Figure 217)*.

Table 61 and Table 62 present results per locality, per state and at the national level for the mean number of danger signs identified by carers.

FIGURE 217:Box plot of state and locality results of number of danger signs identified by carers of children 5 years or older by locality and state

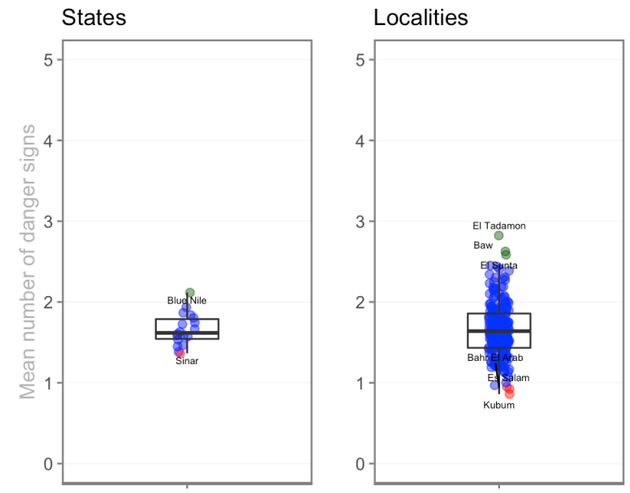


TABLE 61: Number of danger signs identified by carer (max = 5) by state and national

State	No. of signs	95% LCL	95% UCL
Al-Gadarif	1.59	1.39	1.78
Al-Gazeera	1.61	1.47	1.74
Blue Nile	2.12	1.94	2.30
Central Darfur	1.59	1.42	1.75
East Darfur	1.38	1.25	1.52
Kassala	1.87	1.69	2.04
Khartoum	1.74	1.57	1.91
North Darfur	1.80	1.65	1.96

TABLE 61: Number of danger signs identified by carer (max = 5) by state and national

State	No. of signs	95% LCL	95% UCL
North Kordofan	1.94	1.74	2.14
Northern	1.53	1.38	1.68
Red Sea	1.63	1.46	1.80
River Nile	1.47	1.35	1.58
Sennar	1.37	1.22	1.51
South Darfur	1.45	1.30	1.60
South Kordofan	1.84	1.63	2.04
West Darfur	1.73	1.57	1.88
West Kordofan	1.57	1.43	1.72
White Nile	1.67	1.55	1.79
Sudan	1.67	1.51	1.83

TABLE 62: Number of danger signs identified by carer (max = 5) by locality and by state

Location	Mean Number of Danger Signs Identified by Carer (max = 5)		
	Estimate	95% LCL	95% UCL
Dongola	1.31	1.16	1.52
El Golid	1.66	1.56	1.77
Merwoe	1.62	1.48	1.77
El Daba	1.52	1.41	1.66
Halfa	2.05	1.94	2.16
Delgo	1.50	1.30	1.68
El Burgaig	1.46	1.31	1.64
Northern State	1.53	1.38	1.68
El Matama	1.64	1.56	1.73
Shendi	1.56	1.46	1.66
Abu Hamad	1.15	1.04	1.26
Barbar	1.41	1.27	1.56
El Damar	1.50	1.37	1.62
Atbara	1.32	1.23	1.39
El Buhaira	1.60	1.50	1.70
River Nile State	1.47	1.35	1.58
Khartoum	1.46	1.36	1.55
Bahri	1.62	1.49	1.75

Location	Mean Number of Danger Signs Identified by Carer (max = 5)		
	Estimate	95% LCL	95% UCL
Um Durman	1.57	1.33	1.86
Um Bada	2.18	1.95	2.48
Jebel Awlia	1.51	1.41	1.64
Sharg Elneel	1.84	1.68	2.01
Karrari	1.81	1.68	1.97
Khartoum State	1.74	1.57	1.91
Greater Medani	1.68	1.59	1.78
Ganub Elgazira	1.62	1.52	1.72
El Hassahisa	1.77	1.64	1.90
El Kamlin	1.36	1.27	1.45
Sharg El Gezira	1.44	1.28	1.58
Um Elqura	1.71	1.48	1.93
El Managil	1.52	1.42	1.64
El Qurashi	1.78	1.64	1.91
Al-Gazeera State	1.61	1.47	1.74
Sennar	1.56	1.38	1.76
Sharg Sennar	1.21	1.14	1.29
Sinja	1.49	1.40	1.60
Abu Hujar	1.17	1.08	1.27
El Dali	1.18	1.11	1.26
Es Suki	1.37	1.19	1.53
Ed Dinder	1.33	1.18	1.47
Sennar State	1.37	1.22	1.51
Ed Damazine	1.89	1.71	2.05
El Tadamon	2.82	2.64	3.01
El Roseiris	1.79	1.65	1.92
Baw	2.53	2.16	2.86
Geisan	1.90	1.79	2.03
El Kurmuk	2.43	2.26	2.60
Wad El Mahi	2.11	2.01	2.18
Blue Nile State	2.12	1.94	2.30
Kosti	1.83	1.72	1.94
Guli	1.09	0.97	1.25
Tendalti	1.21	1.12	1.31
Es Salam	1.26	1.17	1.39

TABLE 62: Number of danger signs identified by carer (max = 5) by locality and by state

Location	Mean Number of Danger Signs Identified by Carer (max = 5)		
	Estimate	95% LCL	95% UCL
Rabak	1.49	1.41	1.60
El Jabalain	1.63	1.52	1.72
El Diwaim	1.68	1.58	1.79
Um Rimta	1.97	1.87	2.07
El Gitaina	2.22	2.03	2.39
White Nile State	1.67	1.55	1.79
Port Sudan	2.06	1.97	2.15
Swakin	0.94	0.86	1.01
El Gonob Welawlaib	1.92	1.73	2.11
Sinkat	1.58	1.42	1.75
Haya	1.22	1.08	1.33
Dordieb	1.33	1.23	1.44
Tokar	2.02	1.87	2.21
Agig	1.60	1.38	1.84
Gabaot Elma-aadin	1.68	1.57	1.80
Halaeeb (accessible parts)	1.58	1.18	1.85
Red Sea State	1.63	1.46	1.80
Kassala Town	1.90	1.72	2.04
Refi Kassla	1.93	1.80	2.06
Rural Western Kassala	2.14	1.95	2.30
New Halfa	1.75	1.66	1.85
Refi Nahr Atbara	1.77	1.65	1.90
Rural Khashm Elgirba	2.26	2.08	2.41
Rural Wad Elhilaiw	1.63	1.56	1.71
Rural Aroma	1.72	1.54	1.97
Refi North Delta	1.40	1.32	1.48
Refi Hamashkureib	2.37	2.17	2.59
Rural Telkok	1.55	1.31	1.83
Kassala State	1.87	1.69	2.04
Gedaref Town	2.00	1.64	2.39
Middle Geddaref	1.60	1.42	1.78
Elbutana	1.70	1.58	1.81
El Fashaga	1.46	1.36	1.56
El Rahad	1.30	1.22	1.38

TABLE 62: Number of danger signs identified by carer (max = 5) by locality and by state

Location	Mean Number of Danger Signs Identified by Carer (max = 5)		
	Estimate	95% LCL	95% UCL
Gala-a El Nahal	1.54	1.39	1.68
El Fao	1.57	1.49	1.64
El Qureisha	1.73	1.62	1.83
El Mafaza	1.32	1.22	1.43
Basunda	1.36	1.13	1.58
Western Galabat	1.38	1.28	1.49
Eastern Galabat	1.86	1.71	2.01
Al-Gadarif State	1.59	1.39	1.78
Sheikan	1.80	1.70	1.95
Um Rawaba	1.96	1.82	2.10
Um Dam Haj Ahmed	2.12	1.91	2.37
El Rahad	2.03	1.89	2.18
Bara	1.87	1.63	2.11
Gharb Bara	2.16	1.87	2.42
Soudari	1.85	1.65	2.04
Gebrat El Sheikh	2.05	1.74	2.27
North Kordofan State	1.94	1.74	2.14
Kadugli	1.89	1.78	2.01
Reif Shargi	1.77	1.60	1.97
Dilling	1.77	1.50	2.14
El Quoz	1.75	1.63	1.86
Habila	1.56	1.35	1.87
Abassiya	1.90	1.69	2.07
El Rashad	1.71	1.45	1.96
Abu Jubaiha	1.83	1.68	1.99
El Tadamon	1.80	1.67	1.93
Talodi	2.06	1.73	2.25
Ghadeer	1.97	1.69	2.23
El Leri	1.64	1.34	1.92
Abu Karshola	2.15	2.00	2.28
Delami	1.92	1.62	2.21
South Kordofan State	1.84	1.63	2.04
Abu Zabad	1.66	1.50	1.81
ElKhiwai	1.56	1.43	1.66
Ghubaish	1.40	1.25	1.56

TABLE 62: Number of danger signs identified by carer (max = 5) by locality and by state

Location	Mean Number of Danger Signs Identified by Carer (max = 5)		
	Estimate	95% LCL	95% UCL
El Nuhud	1.49	1.38	1.58
El Idia	1.71	1.57	1.85
Wad Benda	1.53	1.40	1.65
Lagawa	1.74	1.60	1.89
Elsunut	1.75	1.51	1.94
Keilik	2.18	2.08	2.26
Es Salam	1.30	1.13	1.50
Babanusa	1.60	1.42	1.78
Abyei	1.42	1.26	1.57
El Dibab	1.81	1.62	1.95
El Meiram	1.43	1.33	1.55
West Kordofan State	1.57	1.43	1.72
El Fasher	1.93	1.83	2.04
Tawila	1.59	1.48	1.74
Melit	1.70	1.61	1.80
Um Kadada	1.69	1.60	1.76
Kebkabiya	2.23	2.11	2.35
Kutum	2.10	2.01	2.18
El Mahalha	1.42	1.32	1.51
Saraf Omra	1.74	1.39	2.04
El Serief	1.10	1.03	1.17
Dar Elsalam	1.94	1.86	2.01
Kelemando	1.68	1.58	1.78
El Tawisha	1.51	1.45	1.57
Um Baru	2.35	2.15	2.51
El Lait	1.51	1.38	1.61
ELkuma	1.60	1.39	1.75
El Tina	1.44	1.22	1.78
Kernoi	2.40	2.25	2.50
North Darfur State	1.80	1.65	1.96
Nyala South	1.22	1.10	1.34
Nyala North	1.36	1.11	1.59
Es Salam	0.91	0.83	1.03
El Wihda	1.27	1.16	1.38
Mershing	1.78	1.33	2.14
Beliel	1.94	1.83	2.04

TABLE 62: Number of danger signs identified by carer (max = 5) by locality and by state

Location	Mean Number of Danger Signs Identified by Carer (max = 5)		
	Estimate	95% LCL	95% UCL
Nitega	2.43	2.32	2.56
Sharg El Jabal (accessible parts)	1.07	1.00	1.20
Kas	1.50	1.40	1.60
Shattaya	1.27	1.19	1.36
Buram	1.20	1.13	1.27
Gereida	1.67	1.55	1.78
El Sunta	2.52	2.41	2.64
El Radoum	1.18	1.07	1.32
Tulus	1.49	1.34	1.80
Damso	1.33	1.18	1.44
Ed Elfursan	1.75	1.56	1.93
Kubum	0.86	0.79	0.91
Kateila	1.50	1.38	1.64
Rehaid Elbirdi	1.28	1.20	1.35
Um Dafoug	1.34	1.26	1.41
South Darfur State	1.45	1.30	1.60
Abu Jabra	1.24	1.12	1.37
Abu Karinka	1.32	1.22	1.42
Bahr El Arab	0.95	0.83	1.06
Adila	1.54	1.43	1.65
Ed Dain	1.69	1.57	1.82
Assalaya	1.49	1.42	1.59
El Firdous	1.30	1.18	1.45
Shia-ria	1.99	1.73	2.30
Yassin	1.24	1.13	1.33
East Darfur State	1.38	1.25	1.52
El Geneina	2.06	1.90	2.23
Habila	1.41	1.32	1.52
Kulbus	1.71	1.59	1.82
Beida	1.84	1.75	1.94
Foro Baranga	1.53	1.42	1.66
Kereneik	2.22	2.10	2.35
Sirba	1.78	1.63	1.97
Jebel Moon	1.90	1.67	2.15

TABLE 62: Number of danger signs identified by carer (max = 5) by locality and by state

Location	Mean Number of Danger Signs Identified by Carer (max = 5)		
	Estimate	95% LCL	95% UCL
West Darfur State	1.73	1.57	1.88
Zalingi	1.23	1.15	1.34
Wadi Salih	1.75	1.60	1.87
Mukjar	1.52	1.38	1.69
Central Jebel Mara	2.14	2.01	2.28
North Jebel Mara	1.41	1.21	1.61
Bendasi	1.56	1.31	1.82
Nertiti	1.63	1.48	1.78
Azum	1.67	1.56	1.80
Um Dukhun	1.30	1.19	1.41
Central Darfur State	1.59	1.42	1.75

Fever was the most common danger sign identified, with 81.8 per cent (95 per cent CI: 75.5-88.2 per cent) of carers in Sudan naming it as a danger sign *(see Figure 218)*. Across the states, fever was consistently the most identified danger sign by carers *(see Figure 219)*.

Tables 63 to 66 present results per locality, per state and at the national level for various danger signs identified by carers.

FIGURE 218: Bar plot of national results of proportion of carers identifying a specific danger sign

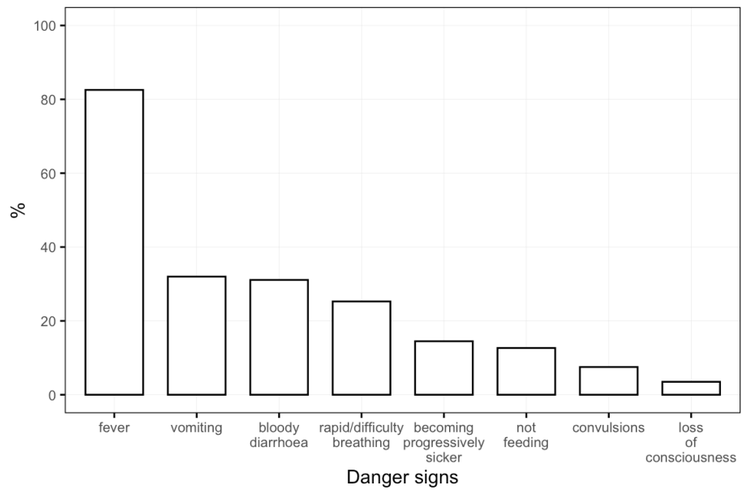


FIGURE 219: Bar plot of state results of proportion of carers identifying a specific danger sign

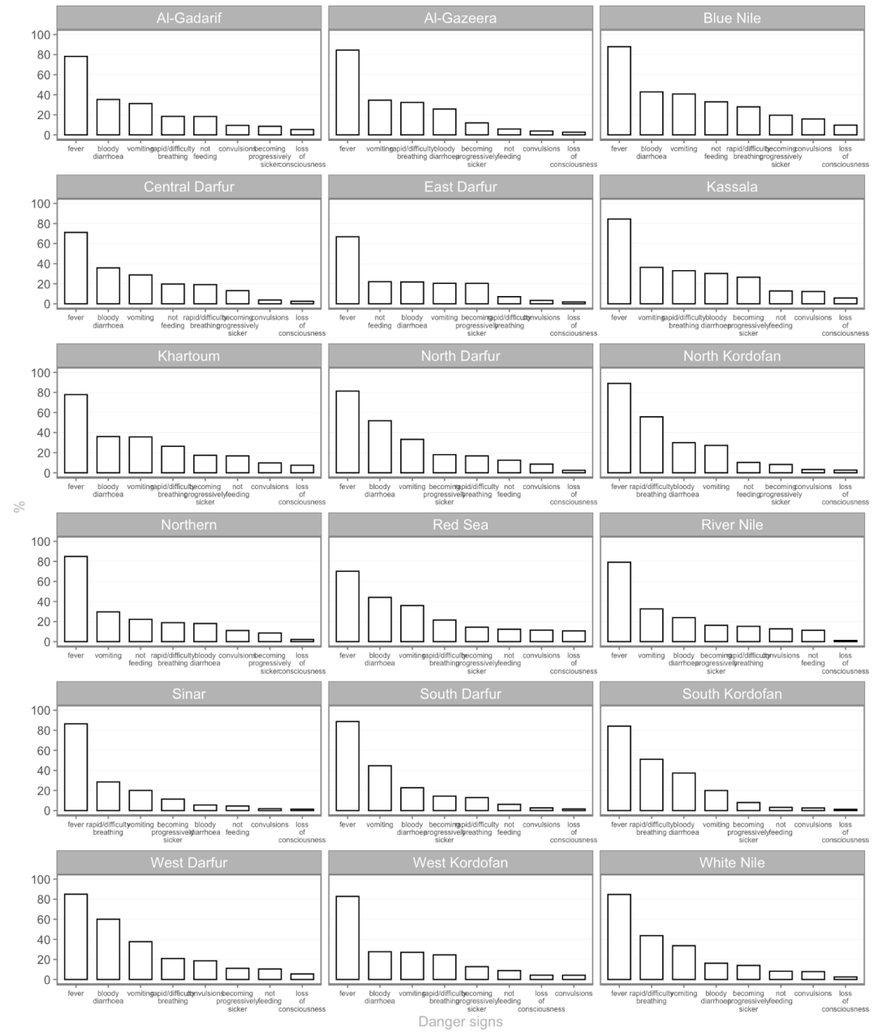


TABLE 63: Not feeding, convulsions, vomiting and bloody diarrhoea recognised by carer by state and national

State	Not feeding %			Convulsions %			Vomiting %			Bloody Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	18.27	10.07	26.47	9.42	4.51	14.33	31.21	20.15	42.26	35.27	23.87	46.68
Al-Gazeera	5.82	2.04	9.60	3.84	0.01	7.70	34.55	25.60	43.49	25.73	17.31	34.15

TABLE 63: Not feeding, convulsions, vomiting and bloody diarrhoea recognised by carer by state and national

State	Not feeding %			Convulsions %			Vomiting %			Bloody Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Blue Nile	32.90	22.73	43.07	15.86	9.37	22.36	40.75	30.18	51.33	42.85	35.15	50.56
Central Darfur	19.67	11.93	27.41	3.76	0.44	7.09	28.79	18.20	39.39	35.81	29.29	42.32
East Darfur	22.04	14.23	29.85	3.33	0.71	5.95	20.44	14.08	26.79	21.79	13.45	30.13
Kassala	12.77	5.34	20.20	12.26	7.75	16.76	36.29	27.86	44.71	30.21	22.29	38.14
Khartoum	16.73	9.36	24.10	9.76	4.14	15.37	35.67	28.33	43.01	36.00	27.94	44.07
North Darfur	12.43	7.13	17.73	8.59	4.48	12.70	33.23	23.22	43.23	51.80	40.15	63.45
North Kordofan	10.22	3.42	17.03	3.17	0.65	5.70	27.22	19.01	35.43	30.00	19.64	40.36
Northern	22.29	13.92	30.66	11.08	4.89	17.28	29.68	21.69	37.67	18.10	11.62	24.57
Red Sea	12.34	3.56	21.11	11.46	4.81	18.10	36.02	26.53	45.52	44.11	35.01	53.21
River Nile	11.34	5.49	17.20	12.79	7.15	18.43	32.64	25.93	39.36	23.92	18.03	29.81
Sennar	4.53	1.56	7.50	1.86	0.14	3.57	20.02	12.41	27.64	5.55	2.15	8.94
South Darfur	6.16	2.32	10.01	2.64	0.01	5.53	44.69	35.16	54.22	22.76	15.24	30.29
South Kordofan	3.19	0.14	6.23	2.57	0.01	6.28	19.95	12.49	27.40	37.39	26.25	48.53
West Darfur	10.44	3.49	17.38	18.65	8.90	28.39	37.74	29.59	45.89	60.06	51.55	68.57
West Kordofan	8.87	3.90	13.85	4.28	0.20	8.37	27.09	16.24	37.93	27.71	19.55	35.87
White Nile	8.24	4.22	12.26	7.86	3.65	12.07	33.69	24.76	42.61	16.25	10.24	22.27
Sudan	12.27	5.93	18.60	7.40	2.69	12.10	33.12	24.30	41.95	31.17	22.64	39.70

TABLE 64: Not feeding, convulsions, vomiting and bloody diarrhoea recognised by carer by locality and by state

Location	Not feeding %			Convulsions %			Vomiting %			Bloody Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	9.09	3.72	16.12	6.48	1.83	12.62	40.55	31.20	48.58	11.11	5.78	17.60
El Golid	38.46	31.31	45.68	1.44	0.20	3.47	13.41	7.81	19.92	2.01	0.38	5.04
Merwoe	38.31	24.68	48.72	38.18	27.38	48.20	39.30	28.48	50.14	37.34	30.21	45.85
El Daba	21.11	12.36	29.97	0.94	0.00	2.36	19.91	13.68	25.70	7.48	3.31	12.71
Halfa	4.35	2.22	6.67	3.64	2.03	5.58	74.79	66.04	81.75	67.28	55.31	79.39
Delgo	1.44	0.20	3.31	1.58	0.40	3.50	18.75	11.83	25.41	21.43	16.04	27.72
El Burgaig	23.39	16.38	29.75	4.67	2.42	7.81	13.75	9.26	19.41	10.22	3.91	18.15
Northern State	22.29	13.92	30.66	11.08	4.89	17.28	29.68	21.69	37.67	18.10	11.62	24.57
El Matama	5.92	2.08	11.48	4.94	1.89	9.06	39.70	33.04	47.34	45.98	38.19	52.97
Shendi	11.97	7.43	17.07	4.73	2.28	7.97	55.29	47.09	62.79	28.75	23.26	33.92
Abu Hamad	15.67	10.23	21.11	33.56	23.99	42.44	9.47	4.85	15.73	10.90	7.10	14.73
Barbar	24.67	14.65	34.48	11.32	6.35	16.23	22.67	17.63	28.20	28.33	21.06	36.94

TABLE 64: Not feeding, convulsions, vomiting and bloody diarrhoea recognised by carer by locality and by state

Location	Not feeding %			Convulsions %			Vomiting %			Bloody Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Damar	4.95	2.97	7.50	9.20	6.18	13.03	22.38	17.51	28.34	13.21	9.32	18.73
Atbara	13.04	7.97	18.57	25.43	18.16	36.03	33.04	25.81	41.05	12.41	8.51	17.30
El Buhaira	4.75	2.35	7.05	18.95	12.54	26.14	34.71	27.78	43.59	54.17	42.28	67.33
River Nile State	11.34	5.49	17.20	12.79	7.15	18.43	32.64	25.93	39.36	23.92	18.03	29.81
Khartoum	6.63	3.41	11.53	3.70	0.60	9.97	24.70	18.48	30.52	22.81	17.38	30.80
Bahri	12.10	7.22	19.08	4.80	2.05	9.10	29.57	21.22	39.01	28.50	20.63	36.04
Um Durman	9.59	4.09	18.55	3.67	1.00	8.02	27.04	20.73	33.54	26.81	20.69	34.34
Um Bada	46.29	31.59	59.34	21.25	14.33	29.44	40.08	32.76	48.58	30.74	23.74	37.31
Jebel Awlia	7.92	3.47	14.27	14.06	6.48	22.18	31.90	24.99	39.45	43.03	31.40	55.28
Sharg Elneel	8.94	4.11	15.20	4.85	2.39	8.52	45.87	39.81	50.74	51.02	44.69	57.55
Karrari	13.77	7.77	21.35	7.91	3.56	13.85	43.19	36.18	50.39	38.77	31.12	45.72
Khartoum State	16.73	9.36	24.10	9.76	4.14	15.37	35.67	28.33	43.01	36.00	27.94	44.07
Greater Medani	10.96	6.45	14.87	3.60	1.66	6.46	39.66	32.79	47.09	25.61	17.94	33.35
Ganub Elgazira	4.76	2.24	8.01	1.64	0.22	3.76	28.33	22.33	35.18	36.90	29.58	45.59
El Hassahisa	5.21	2.55	8.03	0.60	0.00	2.00	28.77	23.02	34.79	30.22	22.05	37.42
El Kamlin	5.33	2.26	8.56	2.85	1.24	4.93	25.57	18.46	32.10	11.83	5.44	20.01
Sharg El Gezira	7.57	3.32	12.83	4.13	1.11	8.41	41.06	33.94	48.38	7.36	2.95	13.32
Um Elqura	15.90	8.56	24.09	23.72	11.73	36.26	59.44	44.62	73.73	28.71	20.49	37.10
El Manaqil	2.94	0.75	6.21	5.22	1.90	9.59	31.32	21.34	42.70	19.45	12.01	29.17
El Qurashi	3.10	1.11	6.05	0.46	0.00	2.21	40.61	31.39	48.32	46.17	37.16	55.16
Al-Gazeera State	5.82	2.04	9.60	3.84	0.01	7.70	34.55	25.60	43.49	25.73	17.31	34.15
Sennar	4.88	2.72	7.76	1.90	0.85	3.55	16.82	11.93	21.36	14.29	9.75	19.98
Sharg Sennar	3.17	1.05	6.48	1.06	0.17	2.47	16.37	9.46	24.17	3.84	1.55	6.74
Sinja	8.90	5.51	13.50	4.83	2.39	8.33	19.12	12.97	25.53	2.74	1.13	5.01
Abu Hujar	3.41	1.12	6.27	0.27	0.00	1.63	17.78	10.54	24.17	3.34	0.97	6.63
El Dali	2.81	0.94	5.01	0.19	0.00	0.95	33.40	26.89	40.15	0.95	0.19	2.24
Es Suki	4.90	1.79	9.13	1.81	0.40	4.46	20.28	14.27	26.94	2.19	0.58	4.61
Ed Dinder	3.13	1.13	5.95	1.84	0.66	4.13	26.68	14.38	39.47	2.64	0.00	7.46
Sennar State	4.73	3.59	6.00	1.91	1.35	2.74	21.58	19.16	24.12	5.24	3.71	6.54
Ed Damazine	37.58	24.93	49.04	8.48	4.33	13.11	43.10	31.75	53.68	33.55	24.89	43.65
El Tadamon	43.77	34.08	51.12	46.80	38.21	55.47	18.02	13.09	23.34	92.27	85.71	97.28
El Roseiris	14.67	9.24	21.78	15.55	8.32	23.01	39.47	32.01	46.06	22.79	16.17	29.46
Baw	52.68	47.49	58.16	44.64	35.43	52.35	37.35	28.92	44.85	39.12	32.93	46.02
Geisan	37.30	26.18	48.20	5.29	0.00	14.40	21.69	2.66	53.11	25.99	17.99	36.37
El Kurmuk	14.94	4.44	29.27	1.66	0.00	5.54	75.32	67.38	81.38	77.60	69.17	85.62
Wad El Mahi	42.62	27.99	53.62	1.17	0.00	3.55	42.44	32.86	52.26	47.95	41.91	54.02
Blue Nile State	32.90	22.73	43.07	15.86	9.37	22.36	40.75	30.18	51.33	42.85	35.15	50.56
Kosti	2.14	0.76	3.86	0.45	0.00	1.66	27.34	18.84	38.13	13.11	7.17	20.28

TABLE 64: Not feeding, convulsions, vomiting and bloody diarrhoea recognised by carer by locality and by state

Location	Not feeding %			Convulsions %			Vomiting %			Bloody Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Guli	3.07	0.55	6.43	10.10	5.71	16.04	35.16	27.33	42.38	11.22	6.85	16.68
Tendalti	0.66	0.00	2.10	3.58	1.75	6.19	23.71	16.90	31.81	15.43	9.88	21.12
Es Salam	0.82	0.00	2.43	5.08	1.85	9.96	19.03	10.21	29.02	10.33	4.17	17.14
Rabak	10.65	6.43	14.95	8.82	4.15	15.17	9.68	6.00	14.31	12.08	8.10	17.00
El Jabalain	4.58	2.44	7.26	6.02	3.82	8.59	61.22	53.33	68.11	14.48	10.87	18.45
El Diwaim	3.10	0.99	6.06	1.75	0.00	4.60	36.99	26.70	47.15	18.40	12.39	27.47
Um Rimta	1.14	0.00	5.00	36.38	26.58	44.50	12.31	5.71	21.01	49.17	42.73	55.86
El Gitaina	38.90	30.57	47.72	16.13	11.58	22.25	66.53	55.63	75.25	13.21	8.55	19.31
White Nile State	8.24	4.22	12.26	7.86	3.65	12.07	33.69	24.76	42.61	16.25	10.24	22.27
Port Sudan	6.09	2.55	12.34	3.15	1.08	6.46	44.94	37.41	52.52	60.78	54.47	68.90
Swakin	0.00	0.00	0.00	0.00	0.00	0.20	8.26	4.04	13.15	18.11	12.26	23.32
El Gonob Welawlaib	42.48	29.57	55.35	36.72	24.61	51.18	35.59	25.75	47.90	36.40	26.09	44.78
Sinkat	1.01	0.00	2.39	4.94	2.26	8.06	34.05	27.07	40.91	55.88	47.92	65.02
Haya	4.18	0.84	9.12	5.02	0.70	11.29	6.83	3.36	11.51	34.40	25.73	44.45
Dordieb	5.57	2.12	9.68	1.81	0.21	4.66	23.87	12.77	36.78	25.16	16.21	33.41
Tokar	8.62	4.36	15.85	23.72	12.56	37.30	76.62	64.96	84.01	48.35	41.60	55.12
Agig	46.39	32.18	59.33	46.87	40.65	53.02	91.13	83.37	97.89	34.27	27.49	40.82
Gabaot Elma-aadin	42.07	32.22	53.49	32.06	21.18	41.05	49.85	42.08	58.10	34.87	22.21	49.02
Halaeeb (accessible parts)	22.62	0.00	37.81	1.02	0.00	6.00	28.95	6.64	47.31	47.96	34.41	59.56
Red Sea State	12.34	3.56	21.11	11.46	4.81	18.10	36.02	26.53	45.52	44.11	35.01	53.21
Kassala Town	16.10	12.12	21.23	21.11	15.06	29.14	53.03	45.55	61.28	18.60	12.48	24.85
Refi Kassla	36.48	24.36	50.60	5.67	2.30	9.59	14.99	6.17	25.99	24.41	14.43	34.97
Rural Western Kassala	0.70	0.00	1.91	3.99	1.90	6.60	29.44	23.78	34.95	34.38	24.51	43.75
New Halfa	1.23	0.16	2.76	1.85	0.61	3.85	22.48	13.75	30.85	18.14	13.06	22.62
Refi Nahr Atbara	1.68	0.62	3.15	1.05	0.21	2.38	52.52	43.56	61.13	25.00	17.64	32.37
Rural Khashm Elgirba	11.37	6.67	17.16	36.53	28.44	45.41	53.59	41.71	66.81	76.94	69.56	83.93
Rural Wad Elhilaiw	4.90	2.51	7.88	2.87	1.23	5.28	62.35	51.49	72.06	35.56	29.71	41.55
Rural Aroma	5.88	2.75	10.74	0.84	0.00	2.10	10.83	5.65	17.09	40.58	29.20	50.79
Refi North Delta	1.13	0.00	2.68	1.85	0.00	4.91	3.19	0.22	8.50	1.83	0.00	5.13
Refi Hamashkureib	17.45	12.42	22.72	35.45	29.24	42.17	47.18	39.64	54.65	68.33	58.50	76.46
Rural Telkok	18.85	9.67	32.91	3.28	1.09	5.46	30.54	21.79	41.25	10.21	2.33	19.22
Kassala State	12.77	5.34	20.20	12.26	7.75	16.76	36.29	27.86	44.71	30.21	22.29	38.14

TABLE 64: Not feeding, convulsions, vomiting and bloody diarrhoea recognised by carer by locality and by state

Location	Not feeding %			Convulsions %			Vomiting %			Bloody Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Gedaref Town	19.06	12.91	26.38	15.77	10.91	21.48	50.08	34.87	63.90	53.26	39.03	68.26
Middle Geddaref	25.59	15.65	36.69	12.66	6.81	19.53	33.47	23.01	43.95	31.41	19.30	43.03
Elbutana	8.76	2.78	16.96	2.28	0.57	4.95	44.66	35.65	52.41	17.33	8.15	27.93
El Fashaga	14.81	7.19	23.68	7.53	3.83	11.80	35.65	30.00	40.75	47.78	39.39	56.25
El Rahad	28.46	19.88	37.25	13.33	8.23	19.21	16.30	10.38	23.14	19.10	12.62	25.42
Gala-a El Nahal	15.49	5.77	27.67	4.96	1.40	10.29	36.13	26.03	47.74	28.91	18.88	40.97
El Fao	29.56	20.71	40.42	3.74	1.59	6.47	18.64	10.14	27.19	32.04	14.59	47.16
El Qureisha	11.74	5.64	19.81	9.77	3.07	19.33	49.04	39.88	58.16	44.38	37.52	51.53
El Mafaza	20.35	10.90	30.43	11.41	6.85	16.05	25.38	19.08	31.68	20.79	15.25	27.30
Basunda	4.81	2.38	8.37	2.84	0.86	5.52	25.64	16.06	36.08	25.42	13.02	38.66
Western Galabat	16.07	10.21	24.61	11.35	4.64	19.69	20.81	13.53	28.77	16.73	11.26	22.56
Eastern Galabat	7.83	2.63	14.92	5.45	2.41	8.83	27.82	11.18	47.00	62.41	52.07	72.92
Al-Gadarif State	18.27	10.07	26.47	9.42	4.51	14.33	31.21	20.15	42.26	35.27	23.87	46.68
Sheikan	7.22	3.90	11.92	3.59	1.67	6.00	18.09	12.77	24.80	17.60	12.23	23.63
Um Rawaba	17.01	8.18	27.07	3.08	1.34	5.24	34.80	25.75	43.85	29.38	21.20	38.30
Um Dam Haj Ahmed	12.83	5.38	19.57	3.66	0.79	8.22	38.41	30.71	46.36	43.24	27.48	59.36
El Rahad	8.80	3.32	15.99	2.48	0.50	5.80	18.02	12.08	25.00	39.95	28.24	51.87
Bara	11.76	6.75	17.01	6.38	3.18	10.16	34.32	25.44	41.99	31.49	20.39	44.04
Gharb Bara	8.44	3.65	15.53	2.75	0.90	5.16	31.51	20.08	43.39	31.54	22.85	41.64
Soudari	7.17	3.04	12.84	2.17	0.44	4.89	19.04	12.30	27.02	26.66	17.67	39.55
Gebrat El Sheikh	11.88	5.91	18.32	1.34	0.00	4.47	37.53	27.12	47.78	46.44	31.63	58.67
North Kordofan State	10.22	3.42	17.03	3.17	0.65	5.70	27.22	19.01	35.43	30.00	19.64	40.36
Kadugli	6.80	3.14	10.44	4.08	2.11	6.75	18.34	13.34	24.13	41.82	32.94	50.06
Reif Shargi	2.65	1.04	4.77	1.87	0.00	4.78	12.13	8.64	16.42	36.80	25.72	47.74
Dilling	1.13	0.00	3.16	3.81	0.00	9.01	22.69	13.96	32.93	36.92	23.18	52.48
El Quoz	6.86	3.09	10.73	2.12	0.57	4.64	16.05	11.07	21.69	27.50	18.68	37.59
Habila	1.95	0.59	4.07	6.04	2.64	9.78	21.36	14.41	28.25	30.64	17.04	45.44
Abassiya	1.57	0.20	3.88	1.56	0.39	3.33	20.27	14.77	26.13	38.25	28.66	48.94
El Rashad	2.42	0.60	5.13	0.67	0.00	2.77	17.14	10.94	25.80	38.77	25.15	53.58
Abu Jubaiha	1.12	0.19	2.44	1.32	0.19	3.25	21.51	15.31	28.59	31.39	20.98	42.17
El Tadamon	1.34	0.00	3.86	0.77	0.00	2.32	25.00	18.73	33.01	41.75	30.70	51.64
Talodi	7.80	0.00	15.39	18.31	2.14	33.33	35.21	18.97	48.61	40.00	27.05	52.57
Ghadeer	2.86	0.37	7.11	1.33	0.00	4.56	22.52	14.42	30.77	53.38	41.13	66.18
El Leri	1.05	0.00	4.00	1.44	0.21	3.76	17.61	11.15	25.48	36.72	28.42	45.49
Abu Karshola	5.53	2.10	9.26	0.00	0.00	0.42	16.01	10.86	21.92	45.89	35.75	54.37
Delami	0.79	0.00	2.69	0.00	0.00	4.30	11.07	3.98	19.84	52.65	36.62	64.92

TABLE 64: Not feeding, convulsions, vomiting and bloody diarrhoea recognised by carer by locality and by state

Location	Not feeding %			Convulsions %			Vomiting %			Bloody Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Kordofan State	3.19	0.14	6.23	2.57	0.01	6.28	19.95	12.49	27.40	37.39	26.25	48.53
Abu Zabad	4.88	1.63	9.28	4.31	0.78	10.18	32.16	15.23	50.60	34.86	22.49	48.61
ElKhiwai	0.00	0.00	0.00	0.42	0.00	1.46	8.79	5.82	12.77	20.92	16.00	26.09
Ghubaish	5.79	2.69	10.71	3.06	0.64	5.89	41.96	23.40	60.56	28.54	20.11	35.40
El Nuhud	2.50	0.79	4.47	0.39	0.00	1.22	12.11	6.36	19.08	26.41	18.88	34.73
El Idia	5.53	2.72	9.38	4.50	2.20	8.08	36.86	22.52	54.07	41.06	34.02	48.13
Wad Benda	8.25	5.63	11.41	0.00	0.00	0.73	18.35	13.91	23.10	26.58	20.58	32.13
Lagawa	10.69	6.78	14.95	0.00	0.00	0.00	16.16	11.47	21.37	37.88	30.09	44.98
Elsunut	7.43	4.54	11.77	6.99	1.59	16.44	59.23	47.29	68.40	49.76	36.57	61.31
Keilik	46.88	38.87	53.52	3.58	1.31	6.02	25.06	19.21	32.93	34.70	30.42	40.82
Es Salam	12.15	7.49	16.99	40.84	30.10	50.56	61.67	50.05	71.48	27.93	22.08	35.10
Babanusa	14.01	9.78	19.74	6.47	3.03	10.59	26.23	16.52	35.23	25.47	16.98	34.74
Abyei	20.88	14.20	26.82	0.00	0.00	0.00	9.02	4.34	14.84	4.34	0.25	10.12
El Dibab	19.07	6.19	32.48	1.03	0.00	4.70	10.42	5.21	17.72	12.95	3.74	25.52
El Meiram	6.53	1.20	16.01	0.00	0.00	0.00	21.60	14.83	28.07	1.00	0.00	3.64
West Kordofan State	8.87	3.90	13.85	4.28	0.20	8.37	27.09	16.24	37.93	27.71	19.55	35.87
El Fasher	20.04	15.50	24.57	7.61	4.90	11.11	37.37	31.28	45.02	48.41	41.37	55.10
Tawila	0.23	0.00	1.31	0.00	0.00	0.64	6.97	3.07	11.93	45.86	39.61	53.84
Melit	1.40	0.20	3.18	0.63	0.00	2.23	16.77	11.65	23.22	47.36	38.08	56.63
Um Kadada	0.41	0.00	2.39	0.68	0.00	1.74	71.52	63.66	78.79	70.26	62.00	78.29
Kebkabiya	47.11	42.30	52.36	46.93	41.85	52.51	59.12	53.67	64.70	71.22	63.31	78.34
Kutum	1.32	0.19	3.14	0.00	0.00	0.00	26.70	20.46	33.16	73.73	65.69	80.48
El Mahalha	1.89	0.00	5.40	3.86	1.08	8.00	19.07	11.83	27.40	41.98	34.87	49.21
Saraf Omra	25.64	12.85	40.10	25.61	13.35	38.08	32.55	16.39	45.37	46.08	24.32	66.16
El Serief	2.04	0.00	4.75	0.00	0.00	0.77	4.83	2.44	7.98	11.22	7.43	16.09
Dar Elsalam	4.07	1.62	7.58	0.00	0.00	0.00	28.07	21.65	35.45	70.48	64.90	75.75
Kelemando	1.38	0.18	2.95	2.60	0.91	4.83	22.34	17.92	27.09	60.35	54.73	66.74
El Tawisha	2.46	0.96	4.62	0.00	0.00	0.34	19.12	11.76	27.01	35.26	29.54	41.57
Um Baru	0.99	0.00	3.75	0.00	0.00	1.91	20.79	14.03	27.49	77.03	62.97	84.42
El Lait	0.70	0.00	2.21	1.34	0.22	3.29	20.33	15.54	25.12	36.73	30.16	42.83
ELkuma	5.71	1.54	11.12	3.70	0.00	7.65	79.27	64.32	87.23	55.46	38.51	71.91
El Tina	0.00	0.00	0.00	0.00	0.00	0.00	66.67	33.33	100.00	44.44	11.11	77.78
Kernoi	27.06	18.36	34.68	3.82	1.92	6.16	26.92	16.59	36.01	47.11	39.76	54.76
North Darfur State	12.43	7.13	17.73	8.59	4.48	12.70	33.23	23.22	43.23	51.80	40.15	63.45
Nyala South	4.48	1.56	8.56	0.16	0.00	0.95	50.29	42.33	57.51	26.16	17.62	34.02
Nyala North	0.00	0.00	4.23	0.00	0.00	0.00	53.10	39.53	74.25	40.97	24.99	57.41

TABLE 64: Not feeding, convulsions, vomiting and bloody diarrhoea recognised by carer by locality and by state

Location	Not feeding %			Convulsions %			Vomiting %			Bloody Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Es Salam	0.00	0.00	0.00	0.47	0.00	1.48	26.44	18.87	37.22	1.31	0.16	7.66
El Wihda	3.08	0.67	6.14	6.97	3.38	11.36	30.49	23.26	36.55	16.41	11.85	21.01
Mershing	12.22	4.84	20.14	2.01	0.81	3.53	13.82	9.52	18.73	43.03	21.30	62.62
Beliel	18.77	13.97	24.00	5.02	3.23	7.21	58.09	53.74	62.61	52.79	47.92	57.51
Nitega	33.33	24.61	43.73	2.68	0.99	5.37	22.89	14.77	29.46	84.69	78.76	88.73
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	53.33	26.67	73.33	6.67	0.00	20.00
Kas	2.25	0.53	5.01	1.26	0.18	3.00	56.29	46.25	66.85	13.88	8.22	22.22
Shattaya	6.37	3.49	9.67	0.22	0.00	1.35	59.25	52.00	67.46	1.53	0.44	3.50
Buram	16.50	11.69	23.01	2.56	0.82	4.59	59.40	52.35	67.30	1.33	0.15	3.50
Gereida	21.71	16.06	26.54	5.54	2.26	10.11	32.90	22.35	44.01	29.11	22.38	36.04
El Sunta	17.61	12.21	24.15	2.83	1.14	4.83	37.78	31.25	44.04	83.52	78.12	88.68
El Radoum	1.09	0.18	2.41	0.37	0.00	1.45	23.44	18.76	28.83	0.18	0.00	0.93
Tulus	1.63	0.00	5.35	1.04	0.00	5.93	77.32	66.44	86.35	31.40	20.28	40.61
Damso	0.35	0.00	2.40	1.03	0.00	3.51	70.65	54.16	83.74	23.55	16.07	30.17
Ed Elfursan	5.56	1.79	9.42	12.71	7.02	18.30	19.17	13.25	25.86	7.52	2.99	12.37
Kubum	0.00	0.00	0.00	0.29	0.00	1.18	16.55	13.20	19.98	0.12	0.00	0.60
Kateila	8.15	3.01	15.99	11.99	4.63	22.40	18.63	12.14	26.15	7.04	2.32	12.54
Rehaid Elbirdi	1.61	0.62	3.08	0.17	0.00	0.99	53.40	47.35	58.84	1.60	0.18	3.46
Um Dafoug	0.00	0.00	0.77	0.50	0.00	1.74	53.69	47.37	60.15	1.00	0.00	3.21
South Darfur State	6.16	2.32	10.01	2.64	0.01	5.53	44.69	35.16	54.22	22.76	15.24	30.29
Abu Jabra	4.59	1.31	8.82	0.00	0.00	1.08	2.83	0.00	8.97	8.19	2.38	16.64
Abu Karinka	17.94	9.51	27.65	4.29	1.86	7.55	46.98	36.18	55.89	26.65	19.75	35.35
Bahr El Arab	42.77	33.65	53.34	1.89	0.32	4.75	11.86	6.64	18.30	5.68	1.93	10.35
Adila	7.99	5.32	11.79	2.67	1.17	4.51	1.91	0.68	3.59	6.98	3.25	13.63
Ed Dain	7.75	3.98	12.79	6.22	2.24	11.87	21.82	15.93	28.40	40.07	30.30	50.02
Assalaya	11.15	6.15	16.28	1.48	0.17	3.55	4.64	2.19	8.02	23.48	16.17	33.39
El Firdous	7.01	3.63	11.47	2.68	0.91	5.03	40.41	33.62	47.96	21.88	14.38	29.13
Shia-ria	88.79	78.32	97.11	9.79	6.37	13.60	31.63	24.40	38.72	55.47	39.71	73.13
Yassin	18.87	6.73	32.29	3.47	1.64	6.51	26.13	18.37	36.14	23.68	13.91	32.83
East Darfur State	22.04	14.23	29.85	3.33	0.71	5.95	20.44	14.08	26.79	21.79	13.45	30.13
El Geneina	6.24	3.39	10.28	16.56	9.01	24.68	37.35	30.53	43.57	63.84	56.27	71.06
Habila	9.63	0.00	22.95	21.75	8.18	38.73	30.53	20.10	41.06	40.92	32.92	48.14
Kulbus	10.71	4.79	17.86	12.12	3.06	23.88	35.68	28.60	42.99	58.64	47.24	68.47
Beida	26.52	17.03	34.91	80.00	65.27	89.66	39.38	32.08	45.94	52.88	49.02	57.91
Foro Baranga	1.24	0.18	2.54	9.68	6.04	14.31	41.10	31.61	50.82	57.65	46.75	68.25

TABLE 64: Not feeding, convulsions, vomiting and bloody diarrhoea recognised by carer by locality and by state

Location	Not feeding %			Convulsions %			Vomiting %			Bloody Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kereneik	11.29	7.83	14.87	8.50	3.34	14.92	31.40	25.75	37.27	66.07	59.01	72.50
Sirba	6.03	1.24	12.58	5.11	2.12	8.56	42.09	34.38	50.70	64.02	54.65	72.06
Jebel Moon	19.60	9.62	32.18	14.91	5.53	26.91	45.47	35.47	55.56	62.88	52.25	71.40
West Darfur State	10.44	3.49	17.38	18.65	8.90	28.39	37.74	29.59	45.89	60.06	51.55	68.57
Zalingi	6.21	2.77	11.06	2.37	1.05	4.01	11.71	8.72	15.51	21.75	16.64	27.75
Wadi Salih	32.99	24.05	42.01	10.91	4.60	18.84	39.02	32.81	44.43	40.61	32.82	46.97
Mukjar	45.86	39.95	51.58	4.55	2.13	7.92	19.91	12.85	28.41	20.04	15.23	25.78
Central Jebel Mara	0.00	0.00	0.00	0.00	0.00	0.00	9.09	4.22	16.55	89.29	81.69	96.40
North Jebel Mara	35.21	21.63	51.35	0.00	0.00	0.00	78.47	49.26	96.68	0.70	0.00	3.50
Bendasi	14.19	8.63	20.40	0.00	0.00	0.00	19.80	14.33	25.82	30.33	22.91	37.89
Nertiti	14.31	6.69	23.38	1.98	0.41	4.11	48.76	41.38	56.00	52.08	45.39	59.83
Azum	4.38	1.28	13.25	3.89	1.83	6.21	14.47	7.31	22.96	29.16	22.68	36.48
Um Dukhun	12.00	5.90	18.98	7.06	2.96	11.76	31.03	21.15	40.05	37.02	30.11	44.24
Central Darfur State	19.67	11.93	27.41	3.76	0.44	7.09	28.79	18.20	39.39	35.81	29.29	42.32

TABLE 65: Fever, loss of consciousness, becoming progressively sicker and rapid or difficulty breathing by state and national

State	Fever %			Loss of consciousness %			Becoming progressively sicker %			Rapid or difficulty breathing %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	78.22	71.06	85.37	5.36	2.13	8.58	8.55	4.18	12.92	18.36	9.70	27.02
Al-Gazeera	84.51	79.06	89.96	2.64	0.36	4.91	11.95	5.15	18.75	32.28	24.89	39.67
Blue Nile	87.93	82.22	93.64	9.71	5.15	14.28	19.60	12.12	27.08	27.93	18.75	37.10
Central Darfur	71.16	61.85	80.47	2.54	0.01	5.07	13.09	6.88	19.31	19.06	14.81	23.31
East Darfur	66.82	58.83	74.81	1.81	0.01	3.66	20.38	12.71	28.06	7.01	3.15	10.86
Kassala	84.47	77.86	91.07	5.76	2.20	9.32	26.45	18.20	34.70	32.98	24.42	41.55
Khartoum	77.85	71.25	84.45	7.44	2.78	12.10	17.37	10.26	24.48	26.36	17.09	35.64
North Darfur	81.38	76.39	86.38	2.38	0.01	4.80	18.01	12.31	23.71	16.74	11.34	22.15
North Kordofan	89.01	84.44	93.57	2.58	0.34	4.82	8.23	2.58	13.88	55.66	44.55	66.77
Northern	84.91	78.43	91.38	2.09	0.01	4.76	8.60	2.80	14.39	18.87	11.64	26.11
Red Sea	70.14	62.98	77.30	10.71	3.46	17.96	14.40	6.85	21.95	21.52	15.05	27.99

TABLE 65: Fever, loss of consciousness, becoming progressively sicker and rapid or difficulty breathing by state and national

State	Fever %			Loss of consciousness %			Becoming progressively sicker %			Rapid or difficulty breathing %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
River Nile	79.12	73.23	85.01	1.20	0.01	2.75	16.29	10.57	22.01	15.26	10.48	20.03
Sennar	86.46	80.58	92.33	1.36	0.01	2.81	11.42	6.29	16.55	28.51	19.53	37.49
South Darfur	88.74	82.23	95.25	1.58	0.01	3.61	14.43	8.65	20.20	12.90	7.81	17.99
South Kordofan	84.16	76.76	91.57	1.22	0.01	3.14	7.99	1.40	14.58	51.13	39.65	62.62
West Darfur	85.00	78.63	91.38	5.51	0.40	10.61	11.17	4.00	18.34	20.90	13.08	28.73
West Kordofan	82.79	75.47	90.10	4.34	0.01	9.27	12.79	6.26	19.31	24.53	15.64	33.42
White Nile	84.74	79.39	90.09	2.55	0.38	4.72	14.00	7.58	20.41	43.68	36.00	51.36
Sudan	81.84	75.50	88.19	4.16	0.66	7.66	14.57	8.02	21.11	26.97	19.01	34.94

TABLE 66: Fever, loss of consciousness, becoming progressively sicker and rapid or difficulty breathing by locality and by state

Location	Fever %			Loss of consciousness %			Becoming progressively sicker %			Rapid or difficulty breathing %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	91.18	86.64	95.13	2.05	0.15	5.43	5.94	1.58	11.26	13.53	7.77	20.99
El Golid	88.10	81.51	94.33	0.41	0.00	1.45	11.13	3.56	21.09	25.62	20.20	31.91
Merwoe	74.18	66.09	81.22	6.01	1.82	10.80	3.61	0.33	8.10	10.09	2.70	20.85
El Daba	84.38	77.18	91.06	0.00	0.00	0.70	12.56	6.27	19.72	26.34	20.60	33.11
Halfa	91.13	85.91	95.21	1.82	0.67	3.72	10.57	4.44	17.67	32.01	25.62	37.42
Delgo	86.02	81.34	90.78	0.00	0.00	0.00	8.23	3.77	14.33	32.26	19.78	43.46
El Burgaig	87.78	83.97	92.24	1.29	0.21	3.01	11.98	8.34	15.97	12.97	7.72	20.29
Northern State	84.91	78.43	91.38	2.09	0.01	4.76	8.60	2.80	14.39	18.87	11.64	26.11
El Matama	82.38	76.91	87.09	2.83	1.06	5.37	1.99	0.43	4.04	27.59	21.57	35.07
Shendi	89.13	84.70	92.47	0.53	0.00	1.68	8.17	3.94	13.60	18.24	13.15	22.65
Abu Hamad	65.46	58.00	75.31	0.24	0.00	1.79	20.80	13.74	29.38	1.82	0.45	3.92
Barbar	72.81	66.33	80.22	0.51	0.00	2.33	5.08	1.28	10.98	8.53	3.82	15.06
El Damar	77.88	73.06	82.57	0.72	0.18	1.66	35.18	28.05	42.50	17.79	14.19	22.28
Atbara	77.73	71.50	83.32	3.45	1.26	5.94	19.26	14.23	25.50	8.70	4.80	12.36
El Buhaira	79.76	74.02	84.25	0.74	0.00	1.80	1.70	0.80	2.93	20.46	12.65	27.76
River Nile State	79.12	73.23	85.01	1.20	0.01	2.75	16.29	10.57	22.01	15.26	10.48	20.03
Khartoum	80.56	73.17	86.88	2.57	0.63	5.04	5.72	2.96	8.81	29.91	23.40	38.15
Bahri	72.20	63.44	80.53	4.36	0.95	8.96	12.25	5.33	21.72	36.08	25.89	47.96
Um Durman	68.14	61.02	75.17	4.04	1.18	8.86	21.16	12.41	30.84	31.89	24.58	40.66

TABLE 66: Fever, loss of consciousness, becoming progressively sicker and rapid or difficulty breathing by locality and by state

Location	Fever %			Loss of consciousness %			Becoming progressively sicker %			Rapid or difficulty breathing %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Um Bada	76.91	71.35	82.52	20.12	13.39	27.42	46.86	37.81	56.91	17.74	11.45	25.97
Jebel Awlia	77.75	70.38	83.98	5.99	2.85	10.03	6.37	3.31	9.83	14.85	4.29	29.10
Sharg Elneel	82.03	75.19	87.73	3.24	0.57	6.97	8.55	4.09	14.27	33.90	25.37	40.67
Karrari	82.03	77.08	85.91	5.83	2.65	10.19	14.18	7.66	22.94	30.71	23.12	38.49
Khartoum State	77.85	71.25	84.45	7.44	2.78	12.10	17.37	10.26	24.48	26.36	17.09	35.64
Greater Medani	88.12	82.52	92.78	2.39	0.69	4.72	16.39	10.34	23.77	27.44	20.03	35.17
Ganub Elgazira	85.15	79.39	89.32	1.85	0.46	3.97	4.89	2.01	9.51	30.59	24.63	37.44
El Hassahisa	81.96	76.95	86.46	5.91	2.69	9.67	29.27	22.94	35.59	30.90	23.75	37.18
El Kamlin	76.13	70.03	82.52	1.26	0.00	3.53	4.05	2.22	6.21	38.89	31.35	46.27
Sharg El Gezira	81.26	74.63	87.83	2.19	0.76	4.19	17.33	5.50	32.83	28.32	20.14	37.87
Um Elqura	83.54	77.91	88.04	8.56	3.97	14.24	13.10	9.50	17.57	28.73	21.95	35.72
El Manaqil	88.97	83.24	93.81	1.94	0.59	3.83	4.62	0.97	11.59	35.32	28.05	41.92
El Qurashi	85.06	79.36	90.56	0.44	0.00	1.66	8.60	4.53	13.32	35.10	27.55	42.99
Al-Gazeera State	84.51	79.06	89.96	2.64	0.36	4.91	11.95	5.15	18.75	32.28	24.89	39.67
Sennar	79.37	72.53	85.22	0.83	0.23	1.77	10.52	6.93	14.56	48.28	35.97	61.59
Sharg Sennar	90.28	85.05	94.76	4.27	2.09	7.44	8.01	4.39	12.22	15.52	9.74	22.31
Sinja	90.64	86.94	93.87	0.30	0.00	1.30	7.20	3.78	12.01	39.47	27.87	50.87
Abu Hujar	92.47	88.54	95.87	0.60	0.00	1.86	4.37	2.09	7.30	13.54	7.55	19.80
El Dali	95.51	92.76	97.91	0.00	0.00	0.76	10.00	6.26	15.74	8.80	4.93	13.26
Es Suki	75.20	65.27	83.74	2.01	0.40	4.21	22.75	17.14	29.50	30.28	23.53	37.97
Ed Dinder	94.89	90.69	98.20	0.00	0.00	0.00	12.67	6.54	21.90	18.56	12.25	26.02
Sennar State	86.46	80.58	92.33	1.36	0.01	2.81	11.42	6.29	16.55	28.51	19.53	37.49
Ed Damazine	91.73	87.06	95.46	0.51	0.00	1.59	11.31	7.81	14.63	14.01	7.84	20.74
El Tadamon	85.79	80.08	91.34	25.06	16.87	32.85	33.33	27.36	39.85	27.68	22.02	33.59
El Roseiris	79.94	72.92	85.90	11.61	7.00	17.00	19.97	13.94	28.72	40.07	31.73	48.00
Baw	82.65	75.67	88.50	35.00	27.88	41.75	39.47	27.87	49.56	39.71	25.87	51.77
Geisan	88.42	78.28	94.91	1.32	0.00	4.01	34.57	22.36	45.24	4.26	1.54	8.95
El Kurmuk	98.58	95.32	100.00	0.64	0.00	3.35	2.41	0.00	6.61	50.96	41.22	58.70
Wad El Mahi	93.37	88.68	97.86	0.41	0.00	1.58	10.78	7.00	14.32	15.09	5.26	27.73
Blue Nile State	87.93	82.22	93.64	9.71	5.15	14.28	19.60	12.12	27.08	27.93	18.75	37.10
Kosti	86.70	81.34	91.29	4.11	1.52	6.88	23.84	14.81	34.30	56.86	48.86	65.41
Guli	82.67	77.00	87.39	1.33	0.00	3.02	2.28	0.39	4.75	10.38	4.00	18.15
Tendalti	81.96	75.50	87.92	4.00	1.99	6.08	0.91	0.00	2.36	21.41	13.94	29.37
Es Salam	90.00	84.28	94.43	2.46	1.01	4.36	3.36	0.97	6.89	22.47	14.84	29.22
Rabak	74.57	67.91	81.45	1.79	0.66	3.29	29.49	18.18	41.23	22.72	15.91	29.09

TABLE 66: Fever, loss of consciousness, becoming progressively sicker and rapid or difficulty breathing by locality and by state

Location	Fever %			Loss of consciousness %			Becoming progressively sicker %			Rapid or difficulty breathing %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Jabalain	91.84	87.21	95.27	1.88	0.57	3.41	7.01	3.57	10.50	44.64	36.39	51.65
El Diwaim	79.30	74.16	83.82	0.99	0.20	2.70	4.48	1.37	8.71	61.43	53.71	69.87
Um Rimta	80.13	71.24	86.65	2.49	1.15	4.71	23.00	15.68	30.13	42.86	37.02	48.01
El Gitaina	94.67	90.91	97.37	3.21	1.01	6.88	12.81	7.39	18.86	60.28	52.10	69.82
White Nile State	84.74	79.39	90.09	2.55	0.38	4.72	14.00	7.58	20.41	43.68	36.00	51.36
Port Sudan	89.25	84.22	92.79	0.73	0.00	2.05	0.36	0.00	1.27	48.57	41.30	55.16
Swakin	70.65	64.53	76.60	1.79	0.22	4.00	0.59	0.00	2.21	4.89	2.86	7.19
El Gonob Welawlaib	84.00	79.19	89.08	3.81	1.35	8.43	21.38	12.79	30.90	8.92	5.52	12.76
Sinkat	68.00	58.77	76.55	0.00	0.00	0.40	14.23	7.27	21.57	18.40	13.93	24.11
Haya	37.09	28.95	44.91	36.58	23.66	50.01	31.72	20.89	41.80	14.77	7.57	22.05
Dordieb	76.77	68.16	87.00	6.38	3.01	10.62	10.08	5.65	15.05	15.11	9.72	21.00
Tokar	94.58	91.21	96.96	5.01	1.72	10.52	15.25	6.48	24.47	36.03	27.34	45.77
Agig	59.69	53.58	66.54	1.08	0.22	3.00	20.00	11.29	29.58	0.00	0.00	0.65
Gabaot Elma-aadin	64.81	54.34	74.21	8.68	4.55	13.29	4.38	0.80	10.53	21.62	14.34	29.08
Halaeeb (accessible parts)	85.00	73.52	94.52	2.41	0.00	12.24	1.85	0.00	6.27	0.00	0.00	0.00
Red Sea State	70.14	62.98	77.30	10.71	3.46	17.96	14.40	6.85	21.95	21.52	15.05	27.99
Kassala Town	83.44	77.59	88.45	12.16	6.77	18.41	46.17	37.73	53.53	23.41	16.22	31.38
Refi Kassla	84.75	77.82	90.12	4.80	2.34	7.58	15.12	9.00	22.22	32.33	24.49	39.33
Rural Western Kassala	90.67	86.02	94.30	2.76	0.87	7.56	18.13	11.07	28.03	70.24	56.93	81.63
New Halfa	77.09	71.76	83.12	1.38	0.46	2.59	15.87	9.10	24.29	62.60	56.06	68.79
Refi Nahr Atbara	91.81	87.18	95.17	0.21	0.00	1.26	18.49	8.60	28.80	40.55	35.50	45.81
Rural Khashm Elgirba	96.68	93.71	98.74	25.94	20.37	31.39	26.00	20.25	31.03	13.75	8.05	19.26
Rural Wad Elhilaiw	93.78	90.61	96.11	2.82	1.06	4.96	13.82	8.40	19.16	14.96	10.12	20.99
Rural Aroma	93.83	87.80	97.71	2.75	0.00	9.83	20.13	9.75	33.06	12.78	7.81	19.30
Refi North Delta	82.32	74.19	89.38	0.00	0.00	0.00	44.81	32.58	55.59	9.31	5.31	14.64
Refi Hamashkureib	85.69	78.42	91.93	7.11	4.18	10.63	27.54	19.29	34.50	38.12	29.91	45.58
Rural Telkok	73.73	62.58	84.81	1.28	0.00	4.28	23.17	14.41	31.34	29.15	17.56	41.87
Kassala State	84.47	77.86	91.07	5.76	2.20	9.32	26.45	18.20	34.70	32.98	24.42	41.55
Gedaref Town	80.38	71.30	88.22	4.11	1.53	7.55	6.59	3.83	11.27	40.03	26.56	51.12
Middle Geddaref	84.17	77.00	89.89	6.81	3.72	10.58	4.94	2.30	8.06	14.90	5.64	26.39
Elbutana	92.79	89.19	95.73	0.20	0.00	1.03	17.43	11.03	25.40	34.48	24.10	43.25

TABLE 66: Fever, loss of consciousness, becoming progressively sicker and rapid or difficulty breathing by locality and by state

Location	Fever %			Loss of consciousness %			Becoming progressively sicker %			Rapid or difficulty breathing %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Fashaga	70.48	60.41	80.87	2.47	0.58	4.87	6.68	3.24	11.03	4.94	0.96	13.76
El Rahad	65.99	58.82	72.71	12.35	7.84	17.01	8.85	6.09	12.12	8.21	4.27	12.85
Gala-a El Nahal	77.70	68.69	85.08	7.57	3.25	14.05	10.30	6.23	15.44	20.14	8.89	32.71
El Fao	81.53	74.63	87.32	5.52	3.00	8.29	8.98	5.42	13.08	3.96	2.13	5.90
El Qureisha	80.27	71.90	86.88	3.95	2.09	6.66	11.52	7.21	16.35	24.14	15.62	35.14
El Mafaza	64.64	57.02	72.46	9.07	4.76	13.40	14.54	9.11	20.81	11.63	6.53	16.35
Basunda	81.78	74.37	87.73	2.44	0.69	5.31	10.58	6.33	17.27	13.00	6.03	20.49
Western Galabat	90.00	85.34	93.94	3.07	0.95	6.36	5.95	2.60	10.10	9.00	3.72	16.14
Eastern Galabat	85.76	80.39	90.04	1.08	0.16	2.68	1.03	0.17	2.57	29.00	20.59	38.80
Al-Gadarif State	78.22	71.06	85.37	5.36	2.13	8.58	8.55	4.18	12.92	18.36	9.70	27.02
Sheikan	90.67	87.77	93.56	2.51	0.76	5.05	10.75	6.11	16.49	54.68	47.99	62.65
Um Rawaba	91.11	87.53	94.56	2.20	0.74	4.46	3.81	1.08	8.76	53.41	41.89	63.94
Um Dam Haj Ahmed	87.95	81.33	92.83	2.91	0.82	6.17	6.12	2.59	10.36	62.37	50.47	74.30
El Rahad	93.63	89.94	96.58	2.23	0.25	5.72	4.55	0.25	10.87	54.25	42.49	66.43
Bara	82.44	75.87	88.64	2.14	0.56	4.39	7.33	3.31	12.46	53.68	38.63	67.39
Gharb Bara	93.85	90.58	96.74	4.20	1.48	8.32	17.25	7.68	27.00	64.53	50.49	78.10
Soudari	87.07	82.05	91.28	1.71	0.47	3.26	11.04	6.29	17.57	50.99	41.43	60.05
Gebrat El Sheikh	82.95	74.75	88.98	3.53	1.64	6.08	4.07	1.00	11.78	58.36	45.71	70.34
North Kordofan State	89.01	84.44	93.57	2.58	0.34	4.82	8.23	2.58	13.88	55.66	44.55	66.77
Kadugli	89.45	86.16	92.78	1.00	0.23	2.22	8.59	5.23	12.98	42.64	34.96	50.37
Reif Shargi	85.18	79.75	90.40	0.00	0.00	0.00	6.86	1.84	12.94	45.59	35.02	57.13
Dilling	82.32	73.60	90.87	0.00	0.00	1.58	3.24	0.66	14.43	52.13	37.55	65.61
El Quoz	81.85	75.68	87.54	1.53	0.00	3.62	11.00	5.26	17.32	47.63	40.37	54.42
Habila	83.70	75.53	91.19	0.19	0.00	1.42	8.32	3.18	14.15	33.74	18.74	48.75
Abassiya	89.88	85.59	94.17	0.20	0.00	1.17	6.50	2.55	12.03	53.62	38.49	66.35
El Rashad	81.24	76.49	87.08	0.80	0.00	2.49	9.07	3.83	15.51	39.54	28.96	51.79
Abu Jubaiha	87.36	81.56	92.99	1.30	0.38	2.68	5.08	1.89	10.04	57.90	47.30	66.56
El Tadamon	80.27	73.14	87.43	2.52	0.96	4.44	13.90	7.54	20.95	43.16	31.79	55.39
Talodi	89.51	65.44	95.77	8.57	2.14	16.67	17.14	0.00	32.64	51.77	36.46	65.06
Ghadeer	82.46	70.79	92.91	0.64	0.00	3.50	7.01	3.28	12.20	50.50	39.13	61.23
El Leri	70.81	57.69	81.49	0.40	0.00	2.94	5.02	2.05	9.25	51.05	42.70	58.77
Abu Karshola	81.68	76.26	86.60	2.10	0.84	3.80	9.00	2.86	17.70	72.42	61.63	78.78
Delami	76.33	65.18	87.86	2.81	0.00	7.60	10.67	1.20	22.19	51.61	36.95	68.87
South Kordofan State	84.16	76.76	91.57	1.22	0.01	3.14	7.99	1.40	14.58	51.13	39.65	62.62

TABLE 66: Fever, loss of consciousness, becoming progressively sicker and rapid or difficulty breathing by locality and by state

Location	Fever %			Loss of consciousness %			Becoming progressively sicker %			Rapid or difficulty breathing %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Zabad	78.63	67.73	89.09	0.98	0.00	2.56	9.29	4.43	15.04	38.32	29.24	47.94
ElKhiwai	73.22	65.51	80.90	0.00	0.00	0.83	11.74	7.71	17.79	49.58	40.24	58.00
Ghubaish	92.31	87.41	96.75	2.32	0.43	4.55	3.46	1.44	5.65	8.99	1.38	20.04
El Nuhud	91.53	87.95	94.50	2.68	0.27	5.81	8.34	4.32	13.02	20.22	11.86	30.10
El Idia	78.53	72.72	84.94	6.18	2.49	11.59	9.78	3.89	16.51	36.18	25.14	49.32
Wad Benda	86.42	82.62	91.20	1.55	0.00	4.16	6.61	4.07	9.30	24.32	17.08	31.23
Lagawa	82.74	76.04	88.26	4.27	1.78	7.59	3.31	1.46	5.85	39.62	31.05	48.14
Elsunut	90.22	79.99	97.67	2.36	0.70	4.77	1.43	0.00	3.26	25.59	18.40	32.58
Keilik	63.92	56.49	71.75	11.17	8.17	15.15	28.57	19.94	36.77	44.04	38.59	49.88
Es Salam	56.95	48.25	65.97	13.55	9.17	17.61	11.72	8.03	16.96	21.14	15.52	26.64
Babanusa	78.81	70.84	87.36	1.77	0.63	3.79	19.29	10.21	28.46	20.99	13.31	29.86
Abyei	81.93	73.80	88.56	8.89	1.22	18.82	24.01	11.05	38.38	9.88	3.86	17.39
El Dibab	86.46	72.17	94.90	19.17	4.39	34.94	38.54	27.08	50.54	22.04	14.97	29.27
El Meiram	76.27	66.14	86.19	0.00	0.00	0.00	55.09	40.11	66.01	5.05	1.69	9.46
West Kordofan State	82.79	75.47	90.10	4.34	0.01	9.27	12.79	6.26	19.31	24.53	15.64	33.42
El Fasher	85.82	82.45	89.19	1.78	0.84	2.90	21.91	15.38	28.42	17.16	13.34	21.67
Tawila	56.33	48.31	63.48	0.40	0.00	1.54	56.42	50.71	62.62	1.22	0.00	3.27
Melit	61.28	54.66	67.01	1.19	0.20	2.64	17.86	9.88	27.63	42.83	30.38	53.96
Um Kadada	91.55	89.23	94.01	1.09	0.40	2.28	5.39	3.17	8.08	0.27	0.00	0.94
Kebkabiya	85.03	80.92	89.10	6.55	2.65	11.72	7.37	4.39	10.22	12.10	8.95	16.05
Kutum	91.98	87.45	95.97	2.58	0.97	4.61	14.03	10.35	18.81	28.04	21.70	35.30
El Mahalha	34.75	28.30	41.50	3.52	1.38	6.79	15.45	10.52	21.24	47.69	39.99	55.83
Saraf Omra	88.89	81.67	94.00	6.88	2.96	11.11	4.13	1.63	6.75	10.40	6.58	13.99
El Serief	77.97	72.62	83.33	0.00	0.00	0.00	8.27	5.21	12.15	11.05	7.72	14.31
Dar Elsalam	91.15	87.67	94.13	0.47	0.00	1.63	8.43	5.42	12.20	19.95	14.35	26.30
Kelemando	79.93	73.73	85.77	1.53	0.36	3.28	8.13	5.26	11.69	18.36	13.99	23.22
El Tawisha	89.49	86.49	92.38	0.00	0.00	0.00	20.80	17.25	24.80	1.97	0.68	3.53
Um Baru	90.37	83.40	95.28	1.47	0.00	3.89	65.06	49.47	76.70	1.79	0.00	5.25
El Lait	73.47	64.57	80.41	2.70	0.44	6.10	8.59	5.31	12.20	30.48	23.78	37.81
ELkuma	97.26	91.57	99.57	2.65	0.00	8.70	0.00	0.00	2.16	1.05	0.00	5.69
El Tina	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kernoi	87.20	83.05	90.53	0.46	0.00	1.62	77.60	65.72	84.57	0.82	0.14	1.87
North Darfur State	81.38	76.39	86.38	2.38	0.01	4.80	18.01	12.31	23.71	16.74	11.34	22.15
Nyala South	88.16	81.46	93.73	0.46	0.00	1.48	2.09	0.61	4.09	1.09	0.14	2.39
Nyala North	93.81	80.49	100.00	1.43	0.00	4.80	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 66: Fever, loss of consciousness, becoming progressively sicker and rapid or difficulty breathing by locality and by state

Location	Fever %			Loss of consciousness %			Becoming progressively sicker %			Rapid or difficulty breathing %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Es Salam	83.58	78.38	88.48	0.80	0.00	2.60	0.00	0.00	2.50	4.92	2.60	7.56
El Wihda	88.02	80.77	92.71	11.07	7.05	15.46	16.77	11.61	22.06	2.71	0.88	5.09
Mershing	91.07	85.68	95.50	5.58	3.23	8.85	14.08	10.40	17.67	15.63	4.72	26.09
Beliel	96.96	95.34	98.24	4.20	2.42	5.97	21.61	17.24	26.04	3.25	1.51	6.07
Nitega	90.59	87.10	93.60	1.23	0.00	2.96	11.06	6.88	16.50	23.43	17.81	29.38
Sharg El Jabal (accessible parts)	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	87.06	80.34	92.50	0.00	0.00	0.73	14.83	10.34	19.93	31.99	26.33	37.94
Shattaya	70.35	61.05	77.08	0.44	0.00	1.55	12.44	8.29	16.96	36.50	29.50	43.70
Buram	94.27	90.78	97.80	0.50	0.00	1.48	1.23	0.00	3.29	5.46	2.87	7.99
Gereida	93.53	90.62	96.01	2.23	0.19	5.70	7.93	2.92	14.59	14.81	10.59	20.09
El Sunta	88.98	83.85	94.03	1.70	0.57	4.23	31.99	25.80	38.71	29.55	24.08	35.75
El Radoum	67.40	59.62	74.76	0.18	0.00	1.12	34.74	28.89	39.77	15.20	10.92	20.07
Tulus	91.13	82.86	97.58	4.72	0.45	9.04	20.38	11.20	33.68	5.14	1.44	14.44
Damso	92.81	85.70	96.59	2.77	1.04	5.17	11.90	6.34	16.62	3.45	1.36	6.47
Ed Elfursan	91.90	87.58	95.08	0.88	0.00	2.16	46.14	37.30	53.32	23.49	13.21	32.81
Kubum	81.40	74.69	85.99	0.39	0.00	1.16	0.00	0.00	0.00	4.36	2.79	6.60
Kateila	89.88	85.29	93.50	0.69	0.00	2.24	40.51	34.40	47.05	4.09	1.28	8.54
Rehaid Elbirdi	90.51	87.10	93.73	0.52	0.00	1.56	4.23	2.04	7.70	29.10	22.56	35.69
Um Dafoug	91.60	86.96	95.26	0.25	0.00	1.49	2.00	0.25	4.72	38.54	32.73	44.75
South Darfur State	88.74	82.23	95.25	1.58	0.01	3.61	14.43	8.65	20.20	12.90	7.81	17.99
Abu Jabra	29.14	16.58	44.21	0.00	0.00	0.87	79.13	63.18	90.74	2.19	0.22	6.68
Abu Karinka	78.74	71.97	84.72	0.22	0.00	1.35	6.14	3.19	9.10	1.31	0.22	2.97
Bahr El Arab	34.08	27.71	41.36	2.82	0.60	6.01	11.64	6.84	17.77	0.31	0.00	1.59
Adila	84.32	73.96	90.28	1.28	0.34	2.50	23.06	15.97	31.87	30.70	23.74	38.70
Ed Dain	92.86	87.43	96.64	1.65	0.00	3.92	12.75	8.64	18.01	15.93	10.25	22.12
Assalaya	79.80	73.69	87.00	1.12	0.32	2.39	33.06	22.46	43.24	1.86	0.50	4.02
El Firdous	86.93	81.84	90.72	5.49	3.38	8.45	11.31	5.60	18.80	3.39	0.68	7.87
Shia-ria	51.22	39.15	65.23	3.50	0.91	7.96	0.00	0.00	0.51	3.72	0.71	7.82
Yassin	53.14	44.21	61.39	1.47	0.20	3.12	24.51	17.37	33.21	2.48	0.40	5.15
East Darfur State	66.82	58.83	74.81	1.81	0.01	3.66	20.38	12.71	28.06	7.01	3.15	10.86
El Geneina	88.83	83.66	93.14	6.77	3.25	11.16	11.10	5.75	17.16	35.25	23.18	48.56
Habila	87.60	79.94	94.12	1.43	0.00	3.62	0.42	0.00	1.54	2.21	0.39	4.89
Kulbus	84.09	74.52	93.20	3.59	1.10	7.36	9.54	2.13	20.49	7.54	3.95	11.92
Beida	92.27	88.04	95.98	0.16	0.00	0.98	4.18	0.97	10.97	7.26	3.18	12.09

TABLE 66: Fever, loss of consciousness, becoming progressively sicker and rapid or difficulty breathing by locality and by state

Location	Fever %			Loss of consciousness %			Becoming progressively sicker %			Rapid or difficulty breathing %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Foro Baranga	87.75	82.74	91.99	2.49	0.72	4.70	5.18	1.95	9.71	2.08	0.54	3.97
Kereneik	80.48	74.64	85.31	5.35	2.53	8.45	17.71	12.33	22.88	47.65	40.65	54.90
Sirba	81.80	72.80	88.91	2.98	0.00	7.07	14.39	6.64	27.31	11.03	2.79	20.64
Jebel Moon	74.39	67.79	80.19	16.78	5.03	31.08	19.60	10.06	31.97	13.75	6.45	21.15
West Darfur State	85.00	78.63	91.38	5.51	0.40	10.61	11.17	4.00	18.34	20.90	13.08	28.73
Zalingi	57.31	51.01	62.78	1.22	0.24	3.43	28.44	23.00	33.72	9.99	7.61	12.51
Wadi Salih	90.96	86.46	94.97	1.37	0.45	2.68	0.16	0.00	0.94	9.54	5.08	17.07
Mukjar	67.54	56.04	79.34	1.48	0.24	2.91	9.70	4.56	16.20	7.87	4.33	11.70
Central Jebel Mara	33.56	19.59	45.79	1.40	0.00	5.68	0.00	0.00	0.00	91.78	85.80	96.53
North Jebel Mara	93.20	85.91	98.65	0.00	0.00	0.00	5.80	0.00	12.43	4.73	0.69	10.21
Bendasi	70.43	60.44	79.72	8.42	4.97	12.81	35.00	22.55	46.80	6.29	3.30	9.93
Nertiti	76.50	66.22	85.42	2.23	0.69	3.97	14.26	7.05	23.65	4.73	2.31	7.94
Azum	98.47	96.33	99.76	1.02	0.00	2.81	32.02	25.00	39.20	2.59	0.99	4.69
Um Dukhun	70.34	58.11	79.70	7.58	2.99	12.84	8.38	4.35	13.48	1.49	0.00	4.63
Central Darfur State	71.16	61.85	80.47	2.54	0.01	5.07	13.09	6.88	19.31	19.06	14.81	23.31

Spatial distribution of recognition of danger signs

FIGURE 220:
Danger signs: Number of danger signs identified by carer (max = 5) (raster)

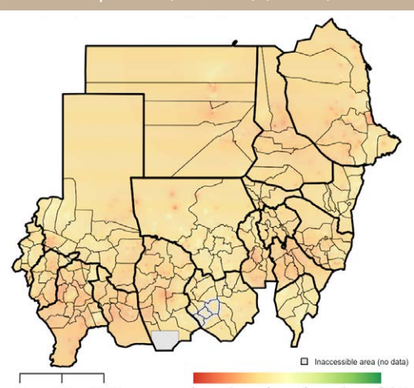


FIGURE 221:
Danger signs: Number of danger signs identified by carer (max = 5)

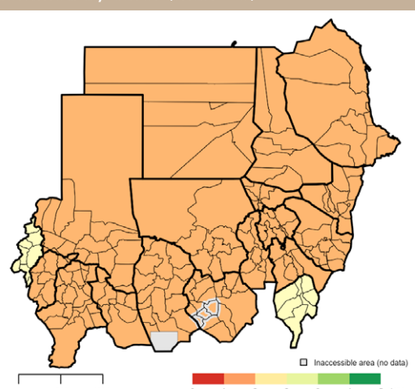


FIGURE 222:
Danger signs: Carer identified not feeding as a danger sign (raster)

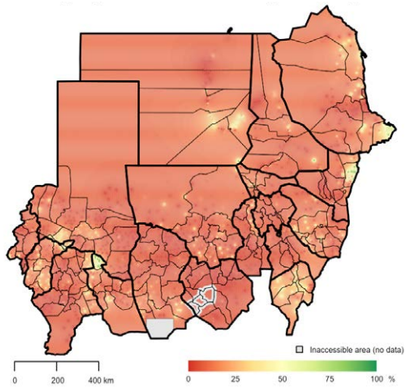


FIGURE 223:
Danger signs: Carer identified not feeding as a danger sign

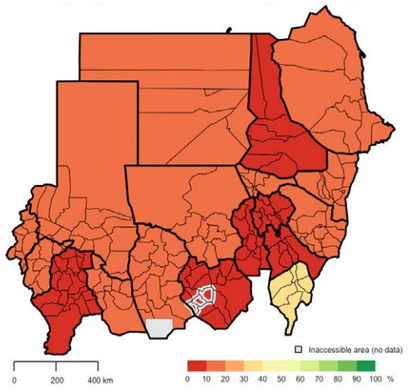


FIGURE 224:
Danger signs: Carer identified convulsions as a danger sign (raster)

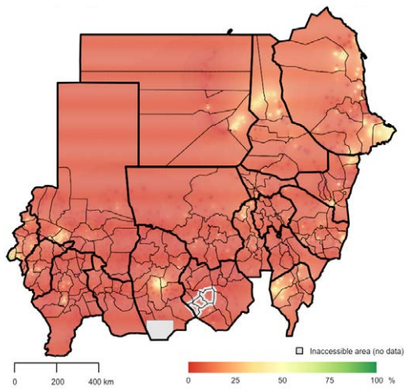


FIGURE 225:
Danger signs: Carer identified convulsions as a danger sign

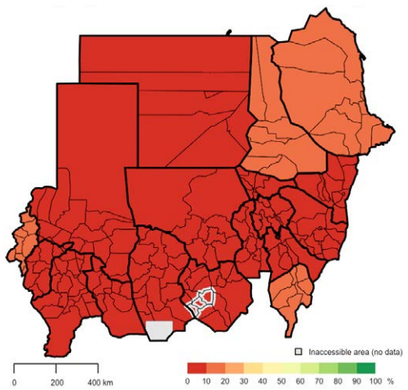


FIGURE 226:
Danger signs: Carer identified vomiting as a danger sign (raster)

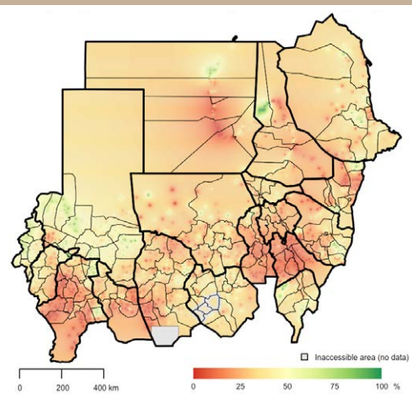


FIGURE 227:
Danger signs: Carer identified vomiting as a danger sign

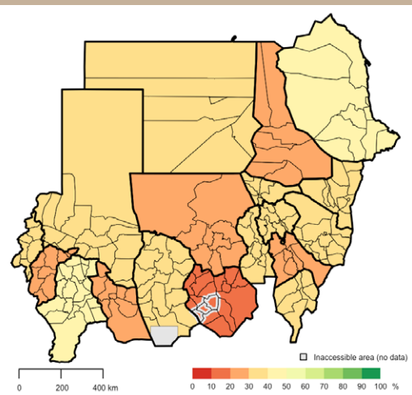


FIGURE 228:
Danger signs: Carer identified bloody diarrhoea as a danger sign (raster)

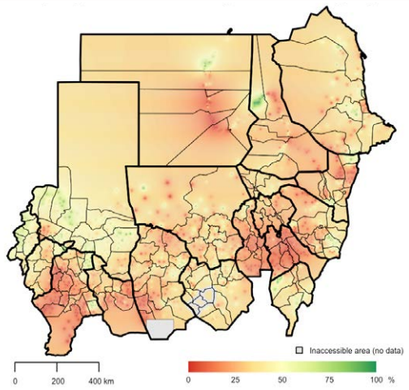


FIGURE 229:
Danger signs: Carer identified bloody diarrhoea as a danger sign

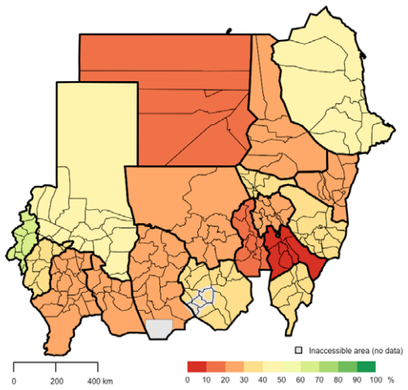


FIGURE 230:
Danger signs: Carer identified fever as a danger sign (raster)

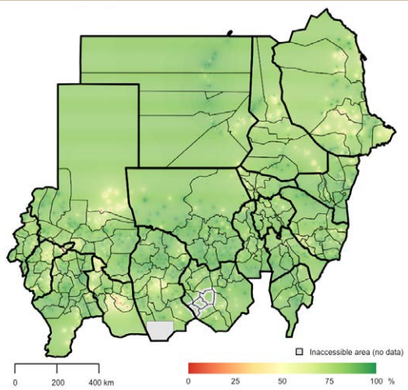


FIGURE 231:
Danger signs: Carer identified fever as a danger sign

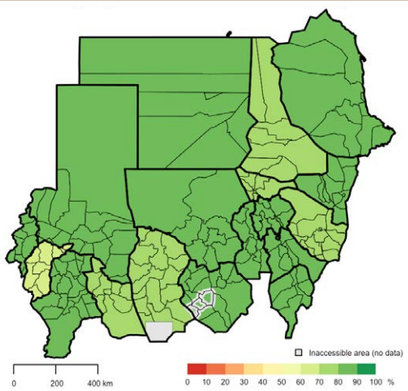


FIGURE 232:
Danger signs: Carer identified loss of consciousness as a danger sign (raster)

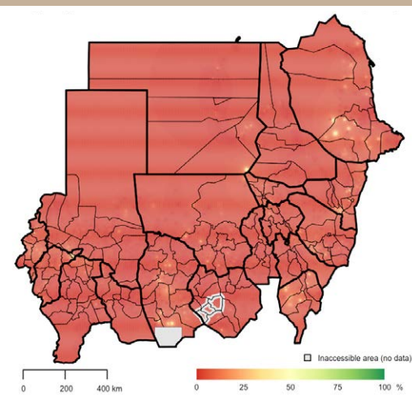


FIGURE 233:
Danger signs: Carer identified loss of consciousness as a danger sign

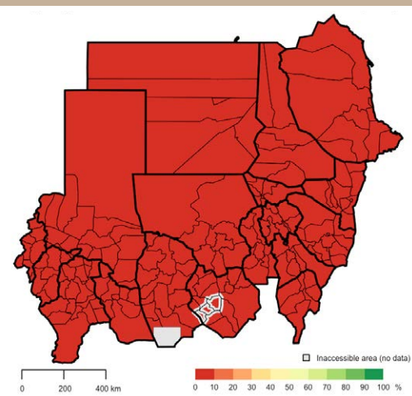


FIGURE 234:
Danger signs: Carer identified becoming progressively sicker as a danger sign (raster)

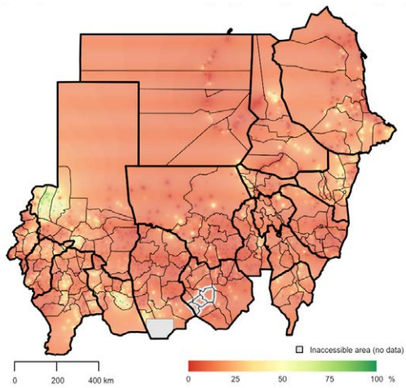


FIGURE 235:
Danger signs: Carer identified becoming progressively sicker as a danger sign

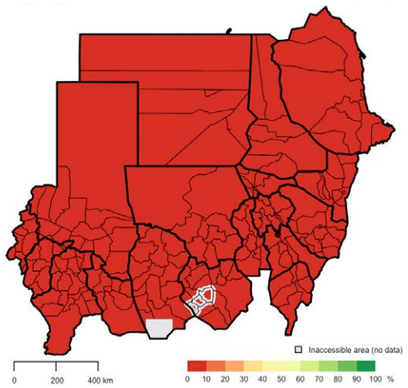


FIGURE 236:
Danger signs: Carer identified rapid / difficulty breathing as a danger sign (raster)

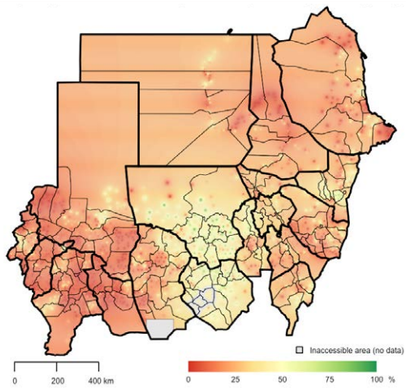
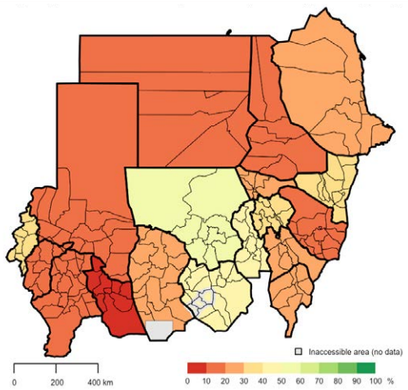


FIGURE 237:
Danger signs: Carer identified rapid / difficulty breathing as a danger sign



3.10.2 Prevalence of childhood illnesses

Prevalence of childhood illnesses average results

Prevalence of diarrhoea among children under the age of 5 years during the survey period of the two weeks prior was 24.0 per cent (95 per cent CI: 17.9-30.1 per cent). Prevalence of acute respiratory infection (ARI) among children during the period or two weeks prior was 23.7 per cent (95 per cent CI: 17.0-30.5 per cent). Prevalence of fever among children during the period or two weeks period was 23.1 per cent (95 per cent CI: 17.2-29.1 per cent).

Al-Gazeera state had the highest prevalence of diarrhoea, and River Nile state had the lowest prevalence. South Kordofan state had the highest prevalence of ARI, and Northern state had the lowest prevalence. South Darfur state had the highest prevalence of fever, and Northern state had the lowest prevalence *(see Figure 238).*

Among the localities, 53 per cent had more than 20 per cent prevalence of diarrhoea during the period, while 61.1 per cent had more than 20 per cent prevalence of fever. Saraf Omra and El Serief localities in North Darfur state and Agig locality in Red Sea state had significantly higher prevalence levels of diarrhoea than any other locality. Baw and El Kurmuk locality in Blue Nile state, North Jebel Mara locality in Central Darfur, state and Um Dafoug locality in South Darfur state had a significantly higher period prevalence of ARI than all other localities. Adila locality in East Darfur state and Um Dafoug locality in South Darfur state had the highest prevalence levels of fever among all localities.

Table 67 and Table 68 present results by locality, by state and at the national level for prevalence of diarrhoea, ARI and fever among children during the survey period.

FIGURE 238: Box plot of state and locality results for period prevalence of childhood illnesses

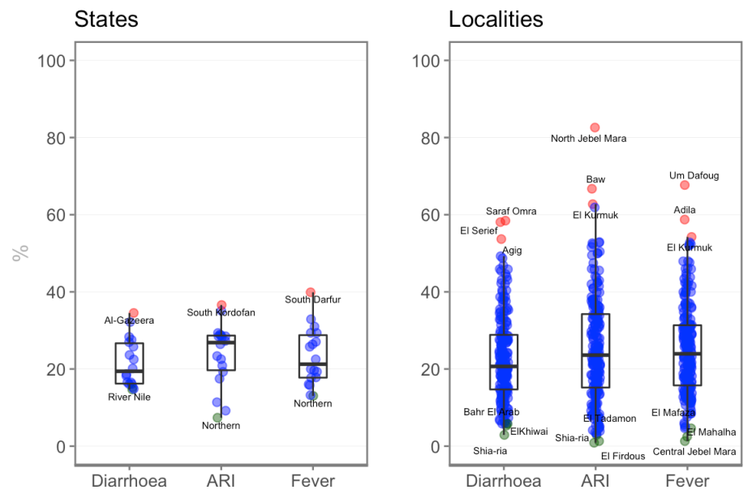


TABLE 67: Period prevalence of diarrhoea, ARI and fever by state and national

State	Period prevalence of diarrhoea %			Period prevalence of ARI %			Period prevalence of fever %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	20.15	13.00	27.31	22.55	14.73	30.37	17.74	10.29	25.19
Al-Gazeera	34.53	28.02	41.03	17.49	12.70	22.28	16.03	11.54	20.52
Blue Nile	25.79	20.09	31.50	28.73	22.22	35.24	26.40	20.10	32.69
Central Darfur	16.06	10.39	21.72	28.20	21.39	35.01	19.99	14.85	25.13
East Darfur	16.52	11.73	21.31	11.38	6.88	15.88	29.37	23.40	35.34
Kassala	18.68	13.57	23.80	35.09	27.41	42.77	19.30	13.21	25.39
Khartoum	27.58	21.91	33.26	20.88	14.94	26.82	17.81	12.57	23.04
North Darfur	32.18	24.17	40.19	28.49	19.16	37.81	32.90	24.96	40.84
North Kordofan	16.11	11.58	20.64	28.95	21.86	36.04	29.35	23.43	35.26

TABLE 67: Period prevalence of diarrhoea, ARI and fever by state and national

State	Period prevalence of diarrhoea %			Period prevalence of ARI %			Period prevalence of fever %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Northern	15.27	9.75	20.80	7.37	3.09	11.65	13.03	8.42	17.63
Red Sea	28.33	20.99	35.68	19.27	10.75	27.79	15.79	10.17	21.41
River Nile	14.69	10.13	19.25	9.19	5.82	12.57	13.22	9.51	16.93
Sennar	14.85	10.36	19.35	26.42	19.65	33.19	27.05	21.00	33.10
South Darfur	26.96	19.87	34.06	29.33	21.44	37.21	39.89	32.88	46.89
South Kordofan	22.48	15.77	29.18	36.60	28.05	45.15	25.77	19.15	32.38
West Darfur	23.63	17.24	30.03	23.36	14.91	31.82	22.51	16.56	28.45
West Kordofan	16.56	11.31	21.82	28.48	22.30	34.67	31.00	24.23	37.78
White Nile	18.23	13.17	23.29	27.28	21.55	33.00	19.65	13.70	25.61
Sudan	23.98	17.90	30.05	23.73	16.96	30.51	23.13	17.15	29.12

TABLE 68: Period prevalence of diarrhoea, ARI and fever by locality and by state

Location	Period prevalence of diarrhoea %			Period prevalence of ARI %			Period prevalence of fever %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	16.63	11.34	23.33	7.66	4.64	11.69	14.55	9.94	19.62
El Golid	27.63	20.99	36.21	8.10	2.96	14.77	11.91	8.02	16.30
Merwoe	7.84	3.09	13.97	4.51	1.48	8.11	8.82	5.14	13.34
El Daba	13.04	9.83	17.14	5.02	1.91	9.24	13.19	9.36	17.72
Halfa	25.51	20.48	30.30	12.15	6.65	18.75	15.67	11.73	20.52
Delgo	26.87	22.16	32.86	16.16	12.09	21.19	13.86	8.85	19.15
El Burgaig	8.69	3.28	15.69	9.00	4.70	15.08	17.07	11.05	24.02
Northern State	15.27	9.75	20.80	7.37	3.09	11.65	13.03	8.42	17.63
El Matama	20.08	16.11	24.30	15.43	10.51	20.61	16.83	12.84	21.23
Shendi	14.71	10.93	17.58	11.16	7.99	14.40	11.51	8.86	14.72
Abu Hamad	8.10	2.24	15.93	4.35	2.55	6.39	7.49	5.23	10.71
Barbar	32.58	25.47	39.02	7.37	3.58	10.98	19.35	14.59	23.32
El Damar	6.84	4.75	8.95	7.85	5.45	10.80	13.81	11.24	16.57
Atbara	11.12	7.26	16.18	7.44	4.02	11.44	10.37	5.90	15.56
El Buhaira	21.36	17.40	26.37	14.21	11.36	16.93	16.06	12.49	20.14
River Nile State	14.69	10.13	19.25	9.19	5.82	12.57	13.22	9.51	16.93
Khartoum	23.51	18.68	28.17	31.05	24.43	37.74	20.47	15.03	26.22
Bahri	27.90	23.13	33.64	16.36	11.04	20.93	10.75	5.91	15.65

TABLE 68: Period prevalence of diarrhoea, ARI and fever by locality and by state

Location	Period prevalence of diarrhoea %			Period prevalence of ARI %			Period prevalence of fever %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Um Durman	21.14	16.25	25.71	26.20	19.85	32.51	12.89	9.46	16.46
Um Bada	27.74	21.54	34.18	15.13	7.96	24.94	15.26	11.21	20.27
Jebel Awlia	29.46	22.64	35.45	22.06	17.80	26.94	29.61	23.13	36.31
Sharg Elneel	32.73	27.57	37.24	21.78	17.25	27.07	15.16	10.80	19.32
Karrari	26.39	20.28	32.95	16.12	11.14	21.50	14.91	9.91	21.70
Khartoum State	27.58	21.91	33.26	20.88	14.94	26.82	17.81	12.57	23.04
Greater Medani	33.70	28.26	39.27	16.83	12.52	21.90	17.91	14.00	22.39
Ganub Elgazira	35.29	28.36	42.99	14.81	11.39	19.16	13.83	9.98	18.03
El Hassahisa	30.09	24.67	35.41	22.44	18.52	26.95	13.65	8.42	18.74
El Kamlin	21.20	13.53	27.69	15.62	11.89	19.67	13.08	9.31	17.24
Sharg El Gezira	39.81	32.93	45.05	13.75	9.95	19.53	13.42	7.91	18.85
Um Elqura	43.97	37.27	51.64	14.46	10.52	18.27	14.74	10.97	19.26
El Manaqil	36.39	29.93	42.55	13.13	9.12	17.94	14.87	11.44	19.13
El Qurashi	38.77	31.36	45.23	30.08	22.27	37.41	27.02	21.58	31.55
Al-Gazeera State	34.53	28.02	41.03	17.49	12.70	22.28	16.03	11.54	20.52
Sennar	16.10	13.39	18.69	31.82	27.79	36.10	22.80	19.06	27.63
Sharg Sennar	5.72	1.40	10.43	9.65	3.19	17.74	30.18	24.41	36.99
Sinja	15.90	12.64	19.81	34.57	27.87	42.11	27.26	22.31	31.46
Abu Hujar	27.20	22.29	32.05	28.10	20.29	37.44	32.67	24.39	41.50
El Dali	10.95	6.69	16.01	28.99	22.44	36.96	31.37	25.55	37.81
Es Suki	11.79	8.53	16.34	28.64	22.63	35.66	20.70	16.21	25.76
Ed Dinder	19.24	13.79	26.05	26.99	21.35	34.28	31.09	24.12	37.63
Sennar State	14.85	10.36	19.35	26.42	19.65	33.19	27.05	21.00	33.10
Ed Damazine	16.61	13.03	20.00	13.07	9.67	17.51	12.56	8.92	16.76
El Tadamon	46.14	41.05	51.32	3.01	1.21	6.61	43.74	37.45	49.38
El Roseiris	15.04	11.21	19.31	23.09	17.98	28.35	29.44	22.84	36.82
Baw	45.21	36.37	52.89	66.33	54.89	73.16	4.95	2.72	8.90
Geisan	11.05	7.56	16.43	18.35	11.87	26.68	20.00	15.87	24.79
El Kurmuk	46.67	39.17	55.68	62.47	51.88	69.74	54.83	43.79	63.39
Wad El Mahi	20.88	15.92	27.31	21.38	14.23	29.62	34.50	28.55	40.66
Blue Nile State	25.79	20.09	31.50	28.73	22.22	35.24	26.40	20.10	32.69
Kosti	21.09	16.64	26.02	44.17	39.86	49.74	17.99	13.46	22.52
Guli	23.36	19.11	27.66	15.84	9.36	23.81	21.53	16.94	26.80
Tendalti	10.25	5.95	15.33	22.82	17.52	28.37	16.59	11.71	22.23
Es Salam	35.46	29.94	40.33	26.29	18.11	34.00	27.75	22.13	33.57
Rabak	11.92	7.72	17.25	13.76	9.88	17.62	24.64	16.03	34.90

TABLE 68: Period prevalence of diarrhoea, ARI and fever by locality and by state

Location	Period prevalence of diarrhoea %			Period prevalence of ARI %			Period prevalence of fever %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Jabalain	17.45	13.36	21.96	19.67	15.55	23.44	14.23	11.51	17.78
El Diwaim	18.00	12.95	23.74	37.96	32.68	43.94	25.61	19.55	31.56
Um Rimta	13.06	7.89	17.83	11.80	7.42	17.30	14.61	10.38	19.64
El Gitaina	17.78	12.78	23.01	23.09	16.23	30.76	13.58	9.30	18.07
White Nile State	18.23	13.17	23.29	27.28	21.55	33.00	19.65	13.70	25.61
Port Sudan	17.29	12.50	23.14	21.84	18.20	25.76	13.94	10.20	18.43
Swakin	42.78	37.69	48.14	21.05	14.75	27.94	14.50	10.71	17.94
El Gonob Welawlaib	39.38	31.41	48.39	32.53	25.21	39.37	16.64	12.03	21.25
Sinkat	19.88	16.24	24.16	6.70	4.00	9.71	16.32	11.69	21.96
Haya	25.16	16.23	36.76	11.01	6.25	15.87	12.54	7.52	19.50
Dordieb	27.60	22.37	32.74	5.10	2.63	8.21	14.99	10.51	19.51
Tokar	27.37	19.96	34.27	25.40	20.53	31.40	19.61	14.17	25.65
Agig	53.27	47.76	58.50	9.82	4.17	16.47	15.26	10.07	22.31
Gabaot Elma-aadin	14.15	8.08	20.20	10.59	4.01	18.50	16.10	9.67	23.89
Halaeeb (accessible parts)	42.86	32.52	51.25	43.70	19.54	61.29	22.68	14.81	32.03
Red Sea State	28.33	20.99	35.68	19.27	10.75	27.79	15.79	10.17	21.41
Kassala Town	8.36	5.40	12.14	31.85	25.14	38.64	14.54	10.91	18.58
Refi Kassla	15.09	11.42	19.31	16.73	12.42	21.51	14.75	10.11	20.59
Rural Western Kassala	23.44	19.83	27.93	46.05	40.44	51.82	20.86	16.12	26.40
New Halfa	17.08	12.55	23.09	48.11	42.57	52.84	12.73	9.78	16.06
Refi Nahr Atbara	7.42	5.40	10.65	32.90	26.30	40.46	11.14	7.57	15.49
Rural Khashm Elgirba	13.01	9.07	17.96	19.26	14.85	23.11	15.40	11.21	19.35
Rural Wad Elhilaiw	30.50	25.21	34.93	11.66	3.01	23.50	7.01	2.28	13.12
Rural Aroma	26.20	17.97	33.92	37.89	32.19	43.53	19.23	14.01	26.25
Refi North Delta	6.89	3.42	11.56	15.23	10.21	20.31	19.43	15.18	23.96
Refi Hamashkureib	38.36	32.74	43.90	47.66	37.00	58.59	37.31	28.29	45.27
Rural Telkok	20.99	15.36	26.68	43.69	33.37	54.02	25.24	17.61	35.69
Kassala State	18.68	13.57	23.80	35.09	27.41	42.77	19.30	13.21	25.39
Gedaref Town	18.54	13.66	23.37	24.92	17.68	32.06	16.48	12.14	21.18
Middle Geddaref	20.32	12.08	28.81	13.87	5.06	23.32	22.83	9.63	38.35
Elbutana	22.20	15.99	30.43	21.00	12.09	30.03	26.28	20.20	31.87
El Fashaga	12.48	7.14	18.99	22.24	13.53	33.90	5.51	2.78	8.98
El Rahad	8.19	3.94	13.84	36.66	28.15	44.79	20.92	14.60	28.86
Gala-a El Nahal	26.04	19.61	33.40	19.63	14.26	25.32	8.63	5.58	12.05

TABLE 68: Period prevalence of diarrhoea, ARI and fever by locality and by state

Location	Period prevalence of diarrhoea %			Period prevalence of ARI %			Period prevalence of fever %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Fao	29.51	23.86	34.90	13.42	6.99	19.98	40.54	28.01	55.22
El Qureisha	18.55	14.34	22.72	28.25	19.50	39.77	11.69	7.55	16.05
El Mafaza	33.16	25.09	41.35	23.01	18.20	28.47	5.98	3.49	9.04
Basunda	19.61	8.91	32.19	8.97	3.76	16.81	14.58	9.60	20.20
Western Galabat	6.24	3.50	11.06	9.00	3.91	15.37	5.99	3.61	8.55
Eastern Galabat	23.99	16.06	31.12	32.89	24.54	41.74	22.63	15.75	29.78
Al-Gadarif State	20.15	13.00	27.31	22.55	14.73	30.37	17.74	10.29	25.19
Sheikan	11.10	7.83	14.49	22.10	17.63	26.19	28.39	24.78	32.70
Um Rawaba	17.38	12.66	22.07	32.22	25.12	39.58	28.44	22.05	34.56
Um Dam Haj Ahmed	24.07	18.18	30.70	42.72	31.47	52.83	33.68	26.82	40.51
El Rahad	17.78	12.68	22.89	29.38	21.42	37.39	26.43	20.85	31.14
Bara	17.26	12.80	22.80	33.88	27.62	41.95	28.72	22.51	34.97
Gharb Bara	10.91	6.81	15.56	24.33	20.25	29.49	29.74	25.00	34.59
Soudari	20.88	16.93	25.32	22.21	14.77	30.45	26.30	19.93	34.89
Gebrat El Sheikh	17.86	12.92	24.09	39.12	30.58	46.97	36.17	29.37	42.85
North Kordofan State	16.11	11.58	20.64	28.95	21.86	36.04	29.35	23.43	35.26
Kadugli	20.25	15.93	24.15	25.28	20.56	29.77	31.29	26.84	35.27
Reif Shargi	25.62	19.45	32.45	29.04	22.83	34.74	18.64	13.36	23.87
Dilling	15.37	8.99	22.61	28.47	23.69	35.01	23.15	17.04	30.10
El Quoz	17.78	12.80	23.60	25.66	19.39	31.64	21.07	17.39	24.32
Habila	14.71	10.40	19.71	28.98	21.31	37.26	21.16	15.99	27.39
Abassiya	15.66	10.21	21.66	40.45	31.73	49.30	27.83	20.38	34.29
El Rashad	18.08	14.22	22.62	32.70	24.54	41.04	27.15	20.48	34.66
Abu Jubaiha	29.90	22.68	37.05	43.69	33.67	53.91	19.32	15.18	25.27
El Tadamon	22.98	16.65	28.34	46.13	36.68	54.84	45.85	34.60	57.42
Talodi	46.32	31.47	60.72	36.64	25.54	49.13	28.88	19.63	36.64
Ghadeer	32.78	24.12	45.34	42.74	30.06	56.72	20.35	14.96	26.46
El Leri	31.05	23.96	36.86	35.45	29.08	43.32	25.36	18.46	33.79
Abu Karshola	22.59	17.07	28.10	48.84	40.75	56.50	28.15	22.88	33.90
Delami	18.96	9.68	28.57	46.01	32.82	57.36	25.57	18.09	33.42
South Kordofan State	22.48	15.77	29.18	36.60	28.05	45.15	25.77	19.15	32.38
Abu Zabad	24.48	17.12	31.82	23.67	19.13	28.92	26.05	20.88	31.82
ElKhiwai	5.69	3.49	8.97	17.98	13.92	22.68	27.40	21.08	33.63
Ghubaish	18.20	13.36	23.30	27.93	22.08	34.03	30.38	22.47	39.56

TABLE 68: Period prevalence of diarrhoea, ARI and fever by locality and by state

Location	Period prevalence of diarrhoea %			Period prevalence of ARI %			Period prevalence of fever %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Nuhud	10.99	6.92	16.24	26.24	21.29	31.41	43.54	36.48	50.86
El Idia	18.16	13.36	24.74	30.80	26.38	35.52	21.41	16.29	26.82
Wad Benda	13.94	10.77	18.21	27.54	22.77	32.73	31.40	25.17	36.75
Lagawa	31.36	26.86	36.27	46.63	37.05	57.12	41.16	35.65	46.76
Elsunut	23.73	17.78	30.28	24.72	19.19	29.85	20.57	14.94	27.50
Keilik	17.14	13.27	22.03	31.30	26.81	37.56	35.90	31.14	40.06
Es Salam	21.99	16.78	27.88	25.29	20.24	30.19	37.75	33.28	42.74
Babanusa	10.97	8.22	14.82	35.36	29.96	40.54	20.71	13.59	29.07
Abyei	11.74	7.59	16.26	24.41	20.28	29.51	31.16	25.62	36.83
El Dibab	16.55	11.50	23.02	22.70	11.14	33.59	31.93	19.84	43.95
El Meiram	9.93	6.30	14.69	49.80	38.12	59.26	18.89	12.95	27.98
West Kordofan State	16.56	11.31	21.82	28.48	22.30	34.67	31.00	24.23	37.78
El Fasher	26.47	20.14	33.17	14.96	11.87	17.90	30.08	23.68	35.91
Tawila	18.55	14.37	22.96	23.71	17.64	30.58	32.20	26.30	37.20
Melit	19.13	14.41	25.31	26.00	20.47	32.22	10.58	8.20	12.85
Um Kadada	18.26	13.23	23.28	38.15	32.21	44.18	47.64	41.84	53.41
Kebkabiya	44.91	37.71	51.56	42.65	35.85	50.35	52.78	46.49	58.27
Kutum	34.70	28.73	41.22	18.23	13.56	24.08	14.42	9.99	19.45
El Mahalha	7.11	4.65	10.16	40.18	30.25	48.83	2.17	0.51	4.46
Saraf Omra	58.80	52.84	65.30	39.22	26.77	51.85	52.25	45.95	58.37
El Serief	59.06	52.79	65.53	34.42	27.70	40.53	41.88	35.06	48.08
Dar Elsalam	20.09	16.20	23.95	16.67	11.30	23.52	36.53	31.01	42.65
Kelemando	27.57	23.02	32.25	33.04	25.28	39.48	34.48	26.75	41.41
El Tawisha	20.77	16.23	24.83	36.62	30.71	41.76	32.83	25.97	39.29
Um Baru	44.17	34.72	52.82	39.13	26.23	50.54	40.26	29.67	46.96
El Lait	29.78	25.72	34.40	26.73	21.51	31.90	22.11	17.09	27.64
ELkuma	18.65	11.17	28.05	16.61	10.31	22.49	18.33	12.39	24.49
El Tina	20.00	0.00	40.50	30.00	10.00	60.00	40.00	10.00	70.00
Kernoi	44.99	39.61	50.68	32.53	27.12	39.46	46.15	41.19	50.40
North Darfur State	32.18	24.17	40.19	28.49	19.16	37.81	32.90	24.96	40.84
Nyala South	25.95	20.76	30.70	34.08	29.26	39.48	35.33	31.37	39.28
Nyala North	37.50	25.94	53.97	53.19	36.10	66.93	42.35	27.07	52.76
Es Salam	7.90	5.38	12.19	11.37	7.68	15.73	39.78	33.95	44.66
El Wihda	19.26	15.34	23.27	16.76	10.12	23.58	26.16	20.30	31.67
Mershing	25.81	20.89	30.79	21.19	17.34	24.95	28.02	22.15	32.80

TABLE 68: Period prevalence of diarrhoea, ARI and fever by locality and by state

Location	Period prevalence of diarrhoea %			Period prevalence of ARI %			Period prevalence of fever %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Beliel	27.61	24.16	31.33	34.43	30.61	38.73	37.18	33.90	40.29
Nitega	43.36	38.85	49.26	20.43	14.25	27.19	45.90	38.77	52.87
Sharg El Jabal (accessible parts)	26.32	10.53	47.37	52.63	26.32	73.68	15.79	0.00	36.84
Kas	30.10	24.61	35.62	31.28	26.61	35.76	45.97	42.08	50.28
Shattaya	32.73	27.71	38.01	30.32	24.62	35.23	44.93	40.09	50.21
Buram	21.18	17.71	25.32	37.78	32.44	42.32	30.52	26.20	34.31
Gereida	25.75	19.16	31.28	39.20	31.22	47.64	21.68	17.11	26.63
El Sunta	30.11	24.98	36.30	27.20	19.72	36.62	37.72	30.09	45.30
El Radoum	36.01	30.60	40.38	36.69	31.02	42.90	31.25	25.56	36.95
Tulus	28.94	20.16	44.19	13.08	6.56	21.04	51.17	41.92	60.59
Damso	22.61	15.08	29.39	21.88	14.83	29.07	42.58	37.42	48.43
Ed Elfursan	14.69	10.79	18.94	16.81	11.11	22.64	26.72	18.16	36.79
Kubum	12.54	9.46	15.45	7.65	5.14	11.35	45.20	39.40	49.82
Kateila	13.53	8.87	18.93	18.93	13.10	25.01	31.25	25.03	37.66
Rehaid Elbirdi	42.68	38.21	48.07	50.04	41.33	62.02	53.81	45.48	60.11
Um Dafoug	40.65	33.64	48.34	61.81	57.26	66.76	67.83	61.79	73.21
South Darfur State	26.96	19.87	34.06	29.33	21.44	37.21	39.89	32.88	46.89
Abu Jabra	21.88	17.61	26.93	10.44	6.16	15.63	30.69	25.10	36.19
Abu Karinka	34.19	27.71	41.82	14.90	10.53	20.10	30.84	24.89	36.59
Bahr El Arab	5.19	2.36	8.51	5.39	2.49	9.52	11.92	8.02	16.12
Adila	10.81	4.94	17.64	29.93	22.67	37.24	58.92	49.87	67.27
Ed Dain	16.67	11.98	21.23	15.04	10.84	19.80	44.96	38.75	51.92
Assalaya	19.47	15.54	22.82	7.64	4.54	12.35	27.59	22.60	32.11
El Firdous	12.26	8.96	16.78	1.59	0.18	3.88	18.65	13.60	26.51
Shia-ria	2.99	1.35	5.28	1.55	0.36	3.17	8.04	5.46	11.07
Yassin	21.88	15.23	28.70	12.47	8.49	16.92	31.66	25.26	37.68
East Darfur State	16.52	11.73	21.31	11.38	6.88	15.88	29.37	23.40	35.34
El Geneina	20.98	16.28	25.94	23.75	15.10	31.06	21.56	17.96	26.09
Habila	18.75	10.49	27.46	20.11	9.32	34.80	23.68	16.02	31.57
Kulbus	13.68	9.46	18.77	28.69	22.34	33.73	20.14	15.12	24.04
Beida	41.07	35.00	46.54	3.79	2.11	6.29	16.19	11.38	21.15
Foro Baranga	32.15	23.74	40.80	10.34	4.68	22.44	41.96	30.18	51.80
Kereneik	35.83	31.66	41.11	49.77	44.77	54.80	32.23	27.84	37.21
Sirba	16.41	9.29	25.17	19.19	10.11	28.52	15.93	10.84	22.40
Jebel Moon	21.00	14.07	27.50	18.23	9.34	28.77	12.34	7.27	17.76

TABLE 68: Period prevalence of diarrhoea, ARI and fever by locality and by state

Location	Period prevalence of diarrhoea %			Period prevalence of ARI %			Period prevalence of fever %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
West Darfur State	23.63	17.24	30.03	23.36	14.91	31.82	22.51	16.56	28.45
Zalingi	8.65	6.71	11.18	23.40	19.37	29.11	21.96	19.30	25.61
Wadi Salih	9.69	5.17	14.52	3.97	1.78	6.69	26.21	20.74	31.92
Mukjar	7.19	4.36	9.70	3.25	1.32	5.58	21.54	17.80	25.79
Central Jebel Mara	38.14	30.66	45.78	53.08	44.35	61.74	1.29	0.00	3.41
North Jebel Mara	27.54	18.55	37.93	83.50	67.45	91.08	7.58	2.41	15.57
Bendasi	6.63	3.67	9.99	13.24	9.13	17.58	30.12	24.43	37.48
Nertiti	14.19	10.77	18.17	22.72	18.76	27.72	28.30	22.22	33.98
Azum	13.93	9.16	20.08	34.82	25.99	44.55	39.61	33.21	44.95
Um Dukhun	13.03	9.30	16.52	12.45	9.25	15.62	21.26	16.87	25.57
Central Darfur State	16.06	10.39	21.72	28.20	21.39	35.01	19.99	14.85	25.13

Spatial distribution of prevalence of childhood illnesses

High prevalence of diarrhoea in children was spread along the east of Sudan, predominantly in Red Sea state and the northern part of Kassala state, and also in the west of the country, mainly in the western areas of North Darfur state and the southern areas of South Darfur state. There were also pockets of high prevalence of diarrhoea in the states of Khartoum, Al-Gazeera and Blue Nile *(see Figure 239).* The spatial pattern of period prevalence of ARI and fever, however, differed from that of diarrhoea, but their patterns were similar to each other; both ARI and fever had areas of high prevalence mostly in the Darfur states and Kordofan states, and areas of lowest prevalence in the east and north of Sudan *(see Figure 241 and Figure 243).*

FIGURE 239:
Child: Period prevalence of diarrhoea (raster)

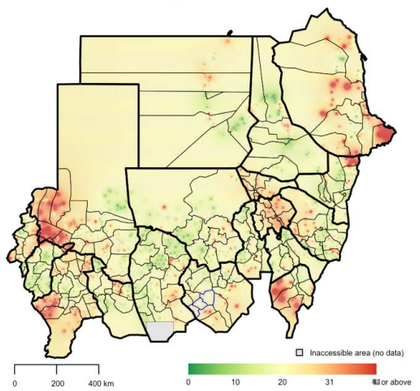


FIGURE 240:
Child: Period prevalence of diarrhoea

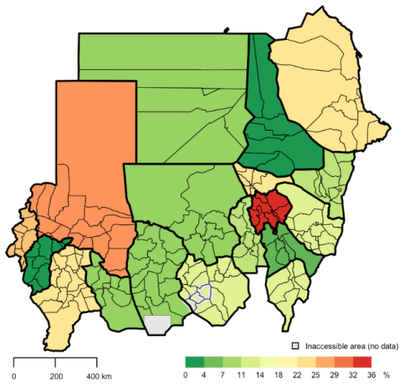


FIGURE 241:
Child: Period prevalence of ARI (raster)

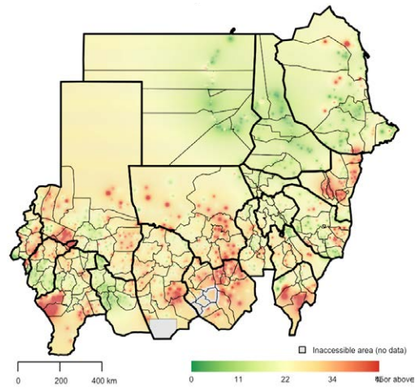


FIGURE 242:
Child: Period prevalence of ARI

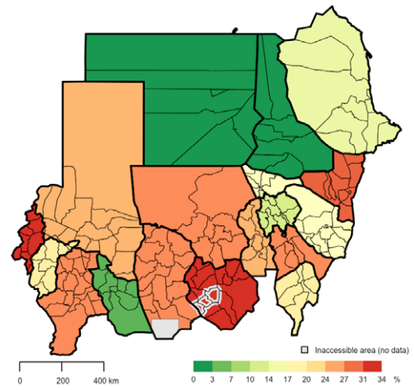


FIGURE 243:
Child: Period prevalence of fever (raster)

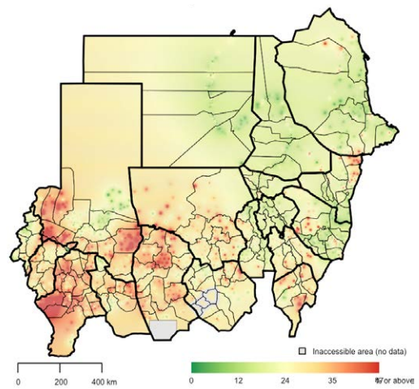
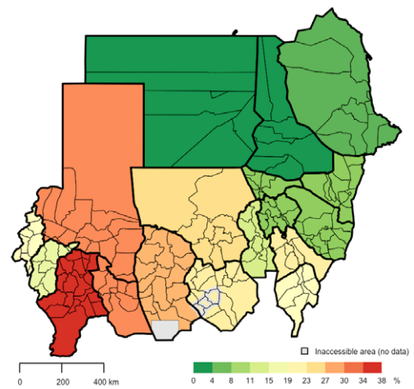


FIGURE 244:
Child: Period prevalence of fever



3.10.3 Treatment-seeking for diarrhoea

Treatment-seeking for diarrhoea average results

Of the children who experienced diarrhoea during the survey period or two weeks prior, 62.9 per cent (95 per cent CI 47.8-77.9 per cent) visited health a health facility. Of these, 56.5 per cent (95 per cent CI 42.9-70.0 per cent) were provided with oral rehydration salts (ORS), either alone or with other interventions.

Blue Nile state had the the highest proportion of children with diarrhoea who were brought to a health facility, while East Darfur state had the lowest. Al-Gadarif state, on the other hand, had the highest proportion of children with diarrhoea who were given ORS and Khartoum state had the lowest proportion *(see Figure 245).*

About 60.5 per cent of localities had more than 60 per cent of children with diarrhoea who visited a health facility; and in about 47.6 per cent of localities, more than 60 per cent of those children with diarrhoea who visited a health facility were given ORS *(see Figure 245).*

Table 69 and Table 70 present results by locality, by state and at the national level for treatment-seeking behavior for diarrhoea.

FIGURE 245: Box plot of state and locality results for treatment-seeking behavior for diarrhoea

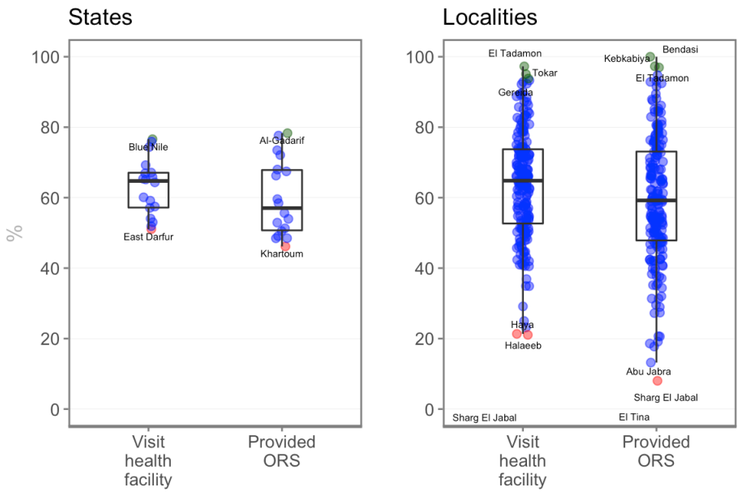


TABLE 69: Treatment-seeking for diarrhoea by state and national

State	Visited Health Facility for Diarrhoea %			Provided Any ORS for Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	66.92	52.11	81.74	78.32	65.85	90.80
Al-Gazeera	65.89	56.63	75.16	48.46	38.76	58.16
Blue Nile	76.60	64.70	88.51	66.26	53.96	78.56
Central Darfur	54.07	35.86	72.28	73.45	57.28	89.62
East Darfur	51.06	33.69	68.44	51.30	30.65	71.95
Kassala	75.92	63.51	88.32	77.62	65.82	89.42
Khartoum	59.15	46.34	71.96	46.16	33.29	59.03
North Darfur	64.33	34.58	94.08	50.53	36.48	64.58
North Kordofan	60.11	46.84	73.38	53.98	40.54	67.42
Northern	65.38	44.63	86.13	72.10	53.80	90.39
Red Sea	53.04	37.82	68.25	67.97	49.79	86.15
River Nile	57.50	42.41	72.59	67.46	53.56	81.36
Sennar	74.36	62.17	86.56	59.58	45.03	74.13
South Darfur	67.12	54.19	80.05	52.91	39.46	66.35

TABLE 69: Treatment-seeking for diarrhoea by state and national

State	Visited Health Facility for Diarrhoea %			Provided Any ORS for Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Kordofan	69.24	57.15	81.33	48.49	34.27	62.70
West Darfur	65.15	53.33	76.97	55.63	43.84	67.41
West Kordofan	51.91	37.29	66.53	49.10	35.49	62.72
White Nile	57.08	44.95	69.22	58.44	46.55	70.33
Sudan	62.87	47.80	77.93	56.46	42.88	70.04

TABLE 70: Treatment-seeking for diarrhoea by locality and by state

Location	Visited Health Facility for Diarrhoea %			Provided Any ORS for Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	74.10	61.07	84.35	69.28	57.24	80.04
El Golid	73.37	61.03	83.81	81.14	66.64	93.00
Merwoe	65.31	23.80	87.05	77.27	40.00	96.37
El Daba	66.29	50.00	80.55	83.58	70.08	94.74
Halfa	61.61	48.70	72.12	65.89	55.00	75.11
Delgo	62.09	45.57	76.35	56.08	43.65	67.59
El Burgaig	48.57	20.43	71.29	54.29	30.00	71.18
Northern State	65.38	44.63	86.13	72.10	53.80	90.39
El Matama	69.53	56.55	80.27	72.27	57.72	84.05
Shendi	50.51	37.73	64.03	70.27	59.17	80.46
Abu Hamad	45.65	24.31	69.66	52.08	29.03	75.03
Barbar	59.32	48.23	69.69	74.36	64.58	83.24
El Damar	66.09	51.27	77.99	61.39	47.10	73.40
Atbara	54.13	38.08	69.65	79.17	62.73	90.38
El Buhaira	47.20	35.60	60.47	52.74	39.61	68.02
River Nile State	57.50	42.41	72.59	67.46	53.56	81.36
Khartoum	56.77	37.89	72.36	54.17	41.64	69.02
Bahri	63.21	47.06	76.25	47.67	35.74	61.15
Um Durman	57.99	47.63	66.67	47.55	36.63	58.48
Um Bada	68.81	58.61	79.05	58.69	45.24	70.25
Jebel Awlia	44.19	32.61	60.17	31.17	21.51	42.69
Sharg Elneel	64.49	52.52	77.10	37.35	19.32	55.86
Karrari	57.23	46.49	71.64	48.72	34.80	59.05

TABLE 70: Treatment-seeking for diarrhoea by locality and by state

Location	Visited Health Facility for Diarrhoea %			Provided Any ORS for Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Khartoum State	59.15	46.34	71.96	46.16	33.29	59.03
Greater Medani	61.94	54.85	71.29	48.35	36.56	58.30
Ganub Elgazira	67.95	56.98	76.75	53.33	44.36	62.67
El Hassahisa	75.46	64.91	84.53	38.94	29.08	50.43
El Kamlin	58.96	47.51	69.44	52.00	39.20	63.39
Sharg El Gezira	55.78	45.68	65.56	50.77	41.80	59.42
Um Elqura	60.84	49.95	70.54	43.00	33.42	53.40
El Manaqil	67.55	56.62	77.17	52.53	44.53	62.00
El Qurashi	70.40	61.85	78.41	47.10	39.13	55.64
Al-Gazeera State	65.89	56.63	75.16	48.46	38.76	58.16
Sennar	70.05	59.65	78.97	62.81	52.29	74.72
Sharg Sennar	89.09	74.97	100.00	62.86	47.05	91.50
Sinja	71.65	61.07	81.21	52.78	38.78	67.93
Abu Hujar	76.72	65.79	85.57	56.04	44.65	68.87
El Dali	81.08	62.78	92.96	73.40	51.78	87.81
Es Suki	69.05	57.39	82.37	67.88	54.95	81.18
Ed Dinder	68.22	50.32	82.00	41.51	27.10	55.30
Sennar State	74.36	62.17	86.56	59.58	45.03	74.13
Ed Damazine	75.21	64.28	85.72	33.92	20.55	48.21
El Tadamon	97.21	94.48	99.10	96.98	93.11	99.33
El Roseiris	79.31	66.88	90.38	66.85	53.73	80.93
Baw	82.64	71.90	91.02	72.49	65.93	80.91
Geisan	65.62	50.50	86.67	75.90	61.40	86.69
El Kurmuk	71.51	57.93	82.93	71.78	59.32	82.33
Wad El Mahi	64.77	56.37	74.18	83.16	72.44	93.64
Blue Nile State	76.60	64.70	88.51	66.26	53.96	78.56
Kosti	48.72	39.71	56.94	56.10	47.63	63.46
Guli	51.05	39.21	64.14	31.16	23.37	40.87
Tendalti	62.50	45.30	77.62	69.44	53.02	84.16
Es Salam	65.98	53.72	75.61	54.36	42.77	64.53
Rabak	44.32	33.33	55.80	44.30	29.95	60.71
El Jabalain	60.81	47.40	75.33	51.37	37.65	65.08
El Diwaim	62.60	50.46	73.89	56.64	43.97	66.69
Um Rimta	45.00	33.76	57.11	85.29	75.26	93.76
El Gitaina	77.19	67.27	86.81	79.41	69.07	88.82
White Nile State	57.08	44.95	69.22	58.44	46.55	70.33
Port Sudan	35.57	21.62	50.45	66.67	53.83	76.99
Swakin	91.91	86.69	95.95	70.38	63.78	76.92

TABLE 70: Treatment-seeking for diarrhoea by locality and by state

Location	Visited Health Facility for Diarrhoea %			Provided Any ORS for Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Gonob Welawlaib	74.24	54.66	88.09	91.36	82.33	96.23
Sinkat	70.31	48.69	84.58	57.35	41.28	72.43
Haya	20.27	8.55	37.38	60.71	33.82	84.47
Dordieb	70.21	46.97	89.89	70.52	47.40	90.66
Tokar	93.94	84.89	98.56	61.94	50.00	74.23
Agig	89.51	81.46	95.63	91.67	82.08	98.08
Gabaot Elma-aadin	65.35	36.90	92.03	87.27	69.22	100.00
Halaeeb (accessible parts)	32.26	7.89	51.86	74.70	39.02	95.30
Red Sea State	53.04	37.82	68.25	67.97	49.79	86.15
Kassala Town	88.57	75.34	97.20	80.33	67.50	90.54
Refi Kassla	80.79	70.44	90.13	60.54	46.01	75.76
Rural Western Kassala	62.65	52.74	72.15	59.92	46.67	72.66
New Halfa	58.45	45.90	71.01	66.67	53.25	76.41
Refi Nahr Atbara	59.46	42.86	74.53	72.73	53.49	89.48
Rural Khashm Elgirba	83.84	71.72	96.35	85.98	74.11	94.44
Rural Wad Elhilaiw	70.45	60.97	79.38	59.50	51.27	68.75
Rural Aroma	76.78	69.66	85.21	87.50	81.18	92.51
Refi North Delta	77.36	48.64	93.33	93.75	79.47	100.00
Refi Hamashkureib	93.31	84.79	98.56	92.45	84.46	98.09
Rural Telkok	65.71	51.47	80.84	79.47	65.92	90.09
Kassala State	75.92	63.51	88.32	77.62	65.82	89.42
Gedaref Town	80.00	69.01	90.44	76.79	65.58	86.40
Middle Geddaref	52.49	37.01	74.45	85.16	67.52	95.35
Elbutana	66.84	57.49	77.37	44.44	31.77	59.21
El Fashaga	57.47	44.94	72.20	78.26	62.99	89.13
El Rahad	46.15	26.80	73.01	88.71	71.42	96.48
Gala-a El Nahal	76.35	61.95	90.08	55.17	38.58	75.16
El Fao	41.95	26.88	60.17	90.64	83.66	95.43
El Qureisha	80.87	69.67	88.79	69.93	49.19	88.32
El Mafaza	86.02	77.46	90.91	83.07	70.23	92.07
Basunda	74.29	53.95	84.79	82.46	64.73	92.33
Western Galabat	85.37	66.67	100.00	68.66	49.04	89.20
Eastern Galabat	67.06	57.54	75.85	77.36	66.24	86.59
Al-Gadarif State	66.92	52.11	81.74	78.32	65.85	90.80
Sheikan	76.22	65.34	87.10	62.38	51.33	72.92
Um Rawaba	58.99	46.71	70.25	41.23	27.73	53.59
Um Dam Haj Ahmed	67.48	53.89	79.04	64.52	52.19	74.43

TABLE 70: Treatment-seeking for diarrhoea by locality and by state

Location	Visited Health Facility for Diarrhoea %			Provided Any ORS for Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Rahad	69.01	49.97	84.51	62.99	43.92	81.82
Bara	44.44	29.57	60.03	59.57	43.45	71.91
Gharb Bara	41.56	27.06	60.71	52.54	38.50	67.09
Soudari	50.29	36.31	65.35	45.95	33.63	59.82
Gebrat El Sheikh	47.62	31.79	63.58	44.37	31.30	55.59
North Kordofan State	60.11	46.84	73.38	53.98	40.54	67.42
Kadugli	69.96	60.91	77.01	52.70	40.96	63.25
Reif Shargi	67.52	58.42	75.35	46.31	38.91	54.76
Dilling	62.50	38.22	82.01	36.00	21.04	49.51
El Quoz	77.90	67.53	87.12	48.30	35.37	62.53
Habila	70.83	60.64	82.12	49.23	35.25	65.91
Abassiya	71.81	62.18	81.43	59.48	42.13	75.01
El Rashad	70.62	60.24	80.91	54.24	39.15	67.57
Abu Jubaiha	58.84	50.64	66.81	38.34	28.49	51.40
El Tadamon	75.00	61.01	85.66	63.60	45.91	79.59
Talodi	81.19	72.16	89.08	42.39	27.00	64.54
Ghadeer	79.69	65.01	88.65	67.82	53.38	81.94
El Leri	63.22	55.37	71.11	54.39	46.11	61.60
Abu Karshola	67.41	56.43	76.05	42.31	32.55	54.74
Delami	77.23	63.84	90.49	47.89	20.60	75.00
South Kordofan State	69.24	57.15	81.33	48.49	34.27	62.70
Abu Zabad	62.56	51.78	76.65	69.41	58.01	82.06
ElKhiwai	72.92	51.01	92.61	53.85	28.99	77.16
Ghubaish	47.74	37.35	58.84	48.03	36.99	62.08
El Nuhud	40.59	29.49	51.78	41.90	26.72	53.83
El Idia	63.16	50.22	73.59	58.51	47.50	68.87
Wad Benda	47.37	33.28	63.56	37.23	27.44	49.17
Lagawa	62.80	47.13	77.15	69.68	55.36	81.48
Elsunut	49.24	34.96	61.49	64.66	55.41	73.72
Keilik	44.44	32.40	56.89	50.75	35.87	62.29
Es Salam	50.70	41.51	60.51	61.05	48.49	71.89
Babanusa	58.14	43.35	73.42	37.14	24.42	50.00
Abyei	51.25	36.08	71.45	38.46	23.52	56.92
El Dibab	57.14	37.28	80.57	45.16	29.49	64.29
El Meiram	48.00	26.30	67.89	20.00	5.25	39.13
West Kordofan State	51.91	37.29	66.53	49.10	35.49	62.72
El Fasher	75.61	69.67	82.55	48.73	34.67	65.19
Tawila	57.26	39.09	73.34	46.63	29.91	62.11

TABLE 70: Treatment-seeking for diarrhoea by locality and by state

Location	Visited Health Facility for Diarrhoea %			Provided Any ORS for Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Melit	68.00	52.11	81.36	56.05	41.48	71.54
Um Kadada	42.98	33.01	50.45	76.15	66.14	84.87
Kebkabiya	90.16	84.52	94.45	97.06	94.37	99.22
Kutum	67.11	56.39	78.77	30.77	18.96	43.77
El Mahalha	66.00	45.61	86.00	58.70	38.88	80.61
Saraf Omra	50.26	35.38	66.97	53.16	32.23	77.97
El Serief	37.88	29.08	46.20	29.46	19.41	40.38
Dar Elsalam	54.76	41.71	68.38	66.43	54.88	79.74
Kelemando	59.81	47.91	70.02	60.59	45.87	76.74
El Tawisha	40.36	28.31	51.82	64.56	52.09	76.84
Um Baru	61.44	52.94	74.00	28.24	18.80	40.62
El Lait	51.78	39.25	61.81	49.70	38.75	59.70
ELkuma	94.59	72.32	100.00	40.62	23.52	56.12
El Tina	NA	NA	NA	0.00	0.00	0.00
Kernoi	79.47	71.81	88.44	15.12	11.55	19.34
North Darfur State	64.33	34.58	94.08	50.53	36.48	64.58
Nyala South	66.16	55.22	76.90	51.10	40.51	63.58
Nyala North	88.64	71.68	100.00	70.00	50.00	85.37
Es Salam	70.24	54.54	88.25	32.67	17.64	50.00
El Wihda	54.02	39.99	66.43	52.00	31.80	70.59
Mershing	66.79	55.85	77.01	61.41	53.42	69.11
Beliel	70.36	63.01	78.31	65.43	58.99	71.91
Nitega	85.66	77.87	90.99	64.88	56.22	71.67
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00
Kas	41.57	28.16	54.51	62.28	53.15	70.95
Shattaya	40.49	27.58	54.36	58.78	47.92	69.41
Buram	72.73	60.49	82.22	18.50	10.00	29.54
Gereida	94.27	88.26	98.09	59.32	47.52	67.82
El Sunta	70.78	57.23	82.05	51.76	40.28	63.25
El Radoum	54.05	45.22	63.30	17.61	11.96	23.63
Tulus	74.29	62.62	86.30	58.72	44.32	74.29
Damso	58.24	46.12	70.34	21.88	11.18	39.48
Ed Elfursan	63.83	44.00	81.22	60.91	39.79	80.18
Kubum	76.92	65.82	85.50	41.09	28.78	54.05
Kateila	57.29	39.17	74.73	60.00	41.97	77.65
Rehaid Elbirdi	62.91	54.60	72.07	78.91	72.55	84.73
Um Dafoug	50.77	40.05	61.91	74.74	60.60	84.79

TABLE 70: Treatment-seeking for diarrhoea by locality and by state

Location	Visited Health Facility for Diarrhoea %			Provided Any ORS for Diarrhoea %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Darfur State	67.12	54.19	80.05	52.91	39.46	66.35
Abu Jabra	47.59	37.90	57.30	7.51	2.13	17.06
Abu Karinka	25.23	16.89	36.94	33.73	18.12	50.48
Bahr El Arab	23.53	3.70	55.56	20.00	0.00	50.08
Adila	76.42	56.52	89.66	76.47	46.04	97.92
Ed Dain	66.36	52.56	76.60	73.11	59.96	85.42
Assalaya	52.44	38.34	65.73	76.11	67.23	85.18
El Firdous	67.44	53.92	81.55	68.32	49.96	81.84
Shia-ria	84.21	56.16	100.00	62.50	31.23	87.50
Yassin	56.82	34.56	77.98	52.57	28.65	74.03
East Darfur State	51.06	33.69	68.44	51.30	30.65	71.95
El Geneina	79.13	70.16	87.97	72.90	62.52	82.51
Habila	53.66	39.18	62.87	55.97	40.16	72.93
Kulbus	52.44	33.60	70.53	26.28	16.43	40.38
Beida	92.58	87.89	96.41	52.13	38.14	65.29
Foro Baranga	44.00	34.07	54.30	35.04	22.60	50.81
Kereneik	61.27	52.66	68.96	60.20	53.62	66.25
Sirba	62.26	50.84	73.44	50.41	37.74	64.13
Jebel Moon	53.44	35.52	71.33	62.40	51.04	72.54
West Darfur State	65.15	53.33	76.97	55.63	43.84	67.41
Zalingi	56.43	41.31	67.88	40.24	26.68	56.05
Wadi Salih	44.23	26.58	60.01	86.84	75.61	96.67
Mukjar	33.33	6.52	65.13	72.92	46.04	91.90
Central Jebel Mara	87.06	77.10	94.50	79.82	66.65	90.21
North Jebel Mara	56.67	38.88	73.02	90.16	79.00	100.00
Bendasi	42.31	19.22	66.73	97.06	77.76	100.00
Nertiti	78.57	65.12	89.81	66.95	50.00	82.24
Azum	79.73	55.12	93.88	80.00	58.51	94.06
Um Dukhun	22.92	10.37	36.23	46.28	24.98	67.01
Central Darfur State	54.07	35.86	72.28	73.45	57.28	89.62

Spatial distribution of treatment-seeking for diarrhoea

Across the country, a moderate proportion of children who had diarrhoea were brought, for the most part, to a health facility. But there were pockets of low rates of visits to a health facility for treatment of diarrhoea in parts of Red Sea state, Sennar state, the Darfur states, and North and West Kordofan states *(see Figure 246)*. The provision of ORS to a child with diarrhoea presented at a health facility was not as evenly spread, with a marked decrease in this approach in areas of North Darfur, Khartoum and Al-Gazeera states *(see Figure 248)*.

FIGURE 246:
Child: Visited health facility for diarrhoea (raster)

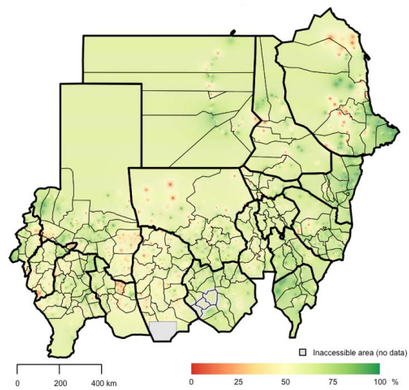


FIGURE 247:
Child: Visited health facility for diarrhoea

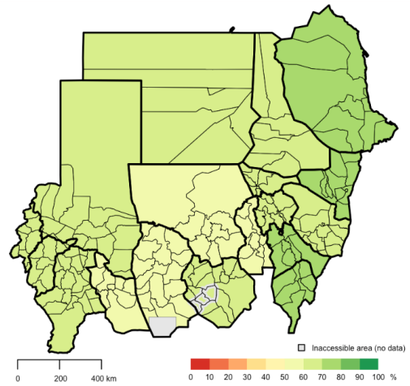


FIGURE 248:
Child: Provided treatment for diarrhoea: Any ORS (raster)

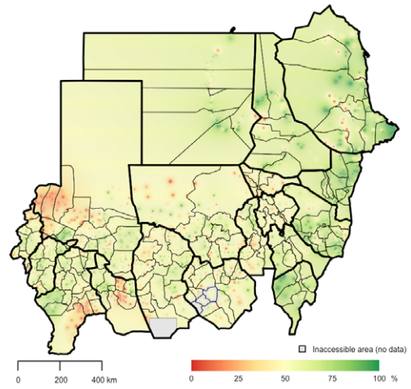
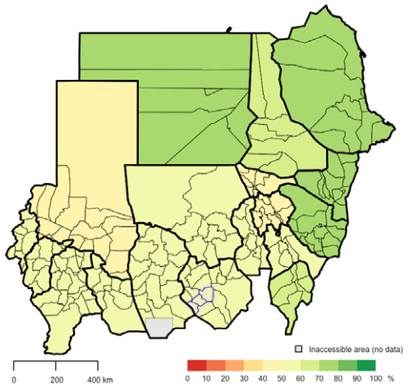


FIGURE 249:
Child: Provided treatment for diarrhoea: Any ORS



3.10.4 Treatment-seeking for acute respiratory infection (ARI)

Treatment-seeking for ARI average results

Of the children who experienced ARI during the two weeks preceeding the survey- 70.1 per cent (95 per cent CI 56.5-83.7 per cent) visited a health facility. Of these, 74.7 per cent (95 per cent CI 61.8-87.7 per cent) were provided with treatment for ARI at the health facility.

Blue Nile state had the highest proportion of children with ARI who were brought to a health facility, while East Darfur state had the lowest proportion. Kassala state, on the other hand, had the highest proportion of children with ARI who were given treatment, and East Darfur state had the lowest proportion *(see Figure 250)*.

But not every child who visited a facility received treatment. About 76.8 per cent of localities had more than 60 per cent of children with ARI who visited a health facility; in an even higher percentage of localities- about 84.9 per cent- more than 60 per cent of those children with ARI and had visited a health facility received treatment *(see Figure 250*).

Table 71 and Table 72 present results by locality, by state and at the national level for treatment-seeking behavior for ARI.

FIGURE 250: Box plot of state and locality results for treatment-seeking behaviour for ARI

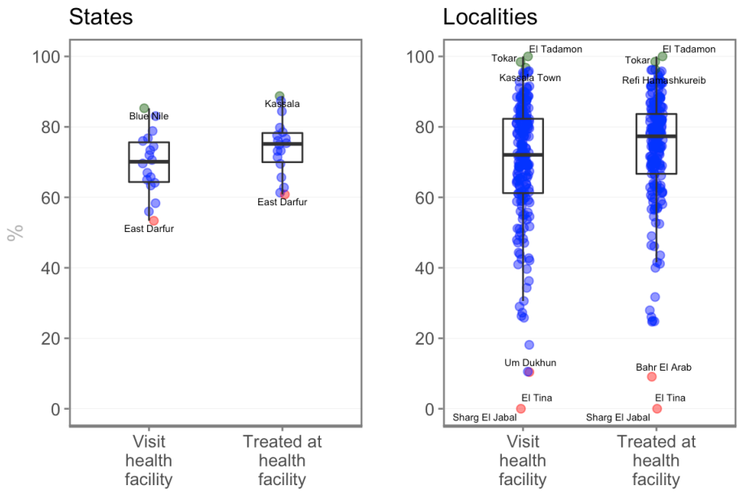


TABLE 71: Treatment-seeking for ARI by state and national

State	Visited health facility for ARI %			Provided treatment for ARI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	76.76	62.62	90.91	79.78	66.32	93.25
Al-Gazeera	71.98	60.14	83.82	76.02	65.98	86.05
Blue Nile	85.29	77.21	93.36	84.42	75.37	93.48
Central Darfur	55.98	38.24	73.72	61.32	43.18	79.47
East Darfur	53.35	27.57	79.14	60.82	33.29	88.35
Kassala	83.06	73.17	92.96	88.75	81.37	96.12
Khartoum	70.59	57.72	83.46	74.94	63.08	86.80
North Darfur	66.95	56.00	77.90	69.51	58.71	80.31
North Kordofan	69.62	57.69	81.54	73.25	61.11	85.38
Northern	65.74	41.89	89.60	73.18	51.50	94.86
Red Sea	63.37	49.05	77.69	65.66	50.43	80.89
River Nile	74.45	59.21	89.69	76.71	61.00	92.41
Sennar	78.83	68.10	89.56	87.36	79.25	95.46
South Darfur	65.00	50.57	79.43	71.42	58.11	84.73

TABLE 71: Treatment-seeking for ARI by state and national

State	Visited health facility for ARI %			Provided treatment for ARI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Kordofan	76.00	67.34	84.67	78.49	70.25	86.73
West Darfur	58.34	43.03	73.66	62.79	48.95	76.62
West Kordofan	64.13	52.85	75.42	75.38	65.37	85.38
White Nile	73.36	61.82	84.90	77.58	67.68	87.48
Sudan	70.10	56.48	83.72	74.72	61.76	87.68

TABLE 72: Treatment-seeking for ARI by locality and by state

Location	Visited health facility for ARI %			Provided treatment for ARI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	70.77	46.98	85.51	82.95	65.93	93.27
El Golid	88.33	78.38	98.19	86.96	72.68	97.63
Merwoe	54.55	18.12	88.93	60.54	28.43	86.73
El Daba	63.64	40.59	88.27	67.74	46.61	87.50
Halfa	43.24	25.23	62.83	64.03	47.72	78.49
Delgo	92.52	84.97	98.27	88.76	79.77	95.77
El Burgaig	58.54	43.58	80.02	71.05	53.41	87.90
Northern State	65.74	41.89	89.60	73.18	51.50	94.86
El Matama	92.55	84.04	99.13	94.26	86.44	98.99
Shendi	83.49	71.18	92.31	77.33	63.15	89.10
Abu Hamad	76.92	54.15	93.95	84.00	63.12	100.00
Barbar	79.41	57.76	97.23	78.85	52.94	95.00
El Damar	63.64	48.00	76.93	68.07	54.30	80.01
Atbara	54.10	34.48	77.41	60.32	39.95	81.08
El Buhaira	73.37	57.57	83.35	80.85	67.02	91.56
River Nile State	74.45	59.21	89.69	76.71	61.00	92.41
Khartoum	67.96	56.47	75.55	74.12	66.32	82.08
Bahri	62.50	42.74	75.23	67.37	50.84	81.12
Um Durman	77.57	67.02	85.06	78.31	69.63	86.16
Um Bada	68.38	50.93	84.34	70.51	56.24	81.41
Jebel Awlia	61.72	46.37	75.86	68.00	53.97	79.86
Sharg Elneel	87.85	78.57	94.40	92.61	86.42	97.80
Karrari	65.99	50.41	77.41	70.90	54.01	83.16

TABLE 72: Treatment-seeking for ARI by locality and by state

Location	Visited health facility for ARI %			Provided treatment for ARI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Khartoum State	70.59	57.72	83.46	74.94	63.08	86.80
Greater Medani	83.51	73.98	92.32	88.07	80.14	94.96
Ganub Elgazira	71.15	58.69	85.30	76.29	59.70	89.42
El Hassahisa	73.25	62.75	83.52	74.21	64.82	84.30
El Kamlin	72.81	58.71	85.44	74.76	60.62	86.82
Sharg El Gezira	69.41	57.52	80.00	70.48	58.02	81.71
Um Elqura	59.68	48.38	71.64	62.22	48.71	76.35
El Manaqil	71.91	56.63	82.85	79.31	69.06	88.92
El Qurashi	69.80	58.89	79.61	74.07	65.59	83.59
Al-Gazeera State	71.98	60.14	83.82	76.02	65.98	86.05
Sennar	81.17	74.63	88.42	84.58	77.88	91.03
Sharg Sennar	89.00	74.11	98.04	87.84	71.14	97.96
Sinja	65.68	54.94	75.70	81.49	74.84	87.50
Abu Hujar	77.96	63.72	91.16	84.72	72.67	94.64
El Dali	84.40	73.53	93.19	87.55	79.53	93.63
Es Suki	82.94	72.58	90.82	91.13	83.02	96.39
Ed Dinder	68.13	52.53	81.61	92.78	85.48	97.63
Sennar State	78.83	68.10	89.56	87.36	79.25	95.46
Ed Damazine	77.30	62.81	87.98	76.84	63.63	86.67
El Tadamon	100.00	100.00	100.00	100.00	100.00	100.00
El Roseiris	94.86	90.27	98.18	94.96	90.89	97.91
Baw	87.99	83.28	91.86	87.47	82.26	91.24
Geisan	86.54	76.59	93.90	75.00	59.62	88.19
El Kurmuk	69.74	58.04	80.01	69.86	58.25	80.44
Wad El Mahi	84.23	76.80	92.58	87.58	80.56	94.45
Blue Nile State	85.29	77.21	93.36	84.42	75.37	93.48
Kosti	66.60	60.54	71.74	68.64	62.90	73.69
Guli	61.59	44.66	84.30	61.76	45.10	91.27
Tendalti	67.96	55.98	80.01	72.50	60.11	83.11
Es Salam	64.56	53.10	79.28	66.67	54.95	78.34
Rabak	70.81	58.31	80.56	79.29	69.99	87.93
El Jabalain	80.67	67.44	90.55	78.92	68.49	86.61
El Diwaim	69.78	56.84	82.04	84.62	77.24	91.21
Um Rimta	75.53	56.06	90.40	78.95	63.29	91.83
El Gitaina	97.19	90.51	100.00	97.71	93.06	100.00
White Nile State	73.36	61.82	84.90	77.58	67.68	87.48

TABLE 72: Treatment-seeking for ARI by locality and by state

Location	Visited health facility for ARI %			Provided treatment for ARI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Port Sudan	61.85	51.68	71.83	88.46	80.80	94.55
Swakin	28.99	19.43	42.11	35.56	26.34	47.02
El Gonob Welawlaib	82.23	65.01	93.99	78.71	63.17	91.58
Sinkat	81.48	59.06	96.78	81.63	61.19	95.92
Haya	25.00	10.00	42.45	33.33	12.50	54.85
Dordieb	82.93	50.00	100.00	75.76	46.91	93.94
Tokar	95.97	89.65	100.00	97.14	91.12	100.00
Agig	90.24	77.96	100.00	89.80	75.51	100.00
Gabaot Elma-aadin	86.05	66.09	96.88	64.29	46.41	90.50
Halaeeb (accessible parts)	80.95	42.76	94.00	28.21	0.00	43.64
Red Sea State	63.37	49.05	77.69	65.66	50.43	80.89
Kassala Town	96.43	90.96	99.61	95.10	90.20	98.63
Refi Kassla	83.54	70.92	93.80	91.16	84.56	95.55
Rural Western Kassala	82.92	77.77	87.99	91.90	86.86	95.57
New Halfa	61.82	50.34	72.43	81.72	74.99	87.13
Refi Nahr Atbara	70.25	59.20	81.25	83.41	73.30	92.13
Rural Khashm Elgirba	85.31	76.64	91.81	85.82	78.74	91.91
Rural Wad Elhilaiw	58.24	42.70	96.17	74.23	62.94	100.00
Rural Aroma	82.69	75.82	88.89	83.78	77.16	89.41
Refi North Delta	80.43	64.18	90.42	80.72	65.98	92.53
Refi Hamashkureib	96.02	88.94	99.44	96.54	91.59	99.68
Rural Telkok	87.72	77.83	95.54	91.51	82.66	96.83
Kassala State	83.06	73.17	92.96	88.75	81.37	96.12
Gedaref Town	85.84	76.70	92.29	91.43	85.09	95.70
Middle Geddaref	85.11	74.02	93.89	95.89	87.49	100.00
Elbutana	71.65	62.78	80.18	75.00	66.83	82.75
El Fashaga	78.95	65.71	87.93	83.33	70.62	91.04
El Rahad	67.16	46.88	84.75	69.96	49.64	87.02
Gala-a El Nahal	81.69	70.86	90.65	84.11	72.86	92.97
El Fao	86.02	71.06	98.31	88.89	77.18	96.03
El Qureisha	80.56	66.53	91.88	77.08	66.67	87.51
El Mafaza	77.99	68.21	86.24	76.54	66.87	84.57
Basunda	68.75	44.35	93.76	71.59	46.37	92.61
Western Galabat	89.86	69.44	100.00	92.73	71.68	100.00
Eastern Galabat	50.83	34.97	70.77	53.23	35.46	69.86
Al-Gadarif State	76.76	62.62	90.91	79.78	66.32	93.25

TABLE 72: Treatment-seeking for ARI by locality and by state

Location	Visited health facility for ARI %			Provided treatment for ARI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sheikan	82.22	75.85	88.15	86.57	80.10	91.20
Um Rawaba	76.60	68.61	83.03	76.25	68.02	83.47
Um Dam Haj Ahmed	67.27	47.93	82.92	70.20	53.86	84.16
El Rahad	75.00	60.83	86.64	79.72	63.87	90.09
Bara	62.54	47.54	75.93	64.00	48.83	78.07
Gharb Bara	70.49	60.81	79.39	78.11	69.75	85.94
Soudari	58.82	40.52	76.04	58.96	44.45	75.24
Gebrat El Sheikh	45.19	29.40	60.07	55.43	39.77	71.35
North Kordofan State	69.62	57.69	81.54	73.25	61.11	85.38
Kadugli	81.76	75.37	87.83	80.98	74.18	85.67
Reif Shargi	82.63	73.66	90.05	79.20	69.82	86.11
Dilling	70.90	58.61	81.82	69.17	53.48	80.85
El Quoz	77.96	69.80	84.39	76.19	67.43	82.58
Habila	80.90	73.16	88.65	77.17	69.18	85.49
Abassiya	82.99	75.94	89.09	82.62	74.22	88.79
El Rashad	79.18	69.68	87.33	85.14	77.00	90.94
Abu Jubaiha	66.16	60.74	72.14	80.83	75.32	86.31
El Tadamon	85.93	77.30	92.80	89.01	81.73	93.88
Talodi	73.68	59.99	86.03	77.01	63.38	88.30
Ghadeer	80.20	69.94	88.84	85.78	76.25	91.78
El Leri	69.38	60.00	78.08	70.96	61.74	78.58
Abu Karshola	67.71	59.57	77.39	68.87	61.14	77.31
Delami	81.00	63.88	93.63	81.03	62.57	92.25
South Kordofan State	76.00	67.34	84.67	78.49	70.25	86.73
Abu Zabad	63.30	49.32	76.08	81.32	71.70	89.10
ElKhiwai	44.09	31.16	58.88	63.64	50.38	76.34
Ghubaish	54.96	38.57	70.58	76.76	64.45	84.93
El Nuhud	60.17	52.39	67.42	74.75	67.20	80.82
El Idia	80.28	67.49	90.36	87.19	78.65	94.39
Wad Benda	44.50	35.36	53.77	68.31	58.37	77.79
Lagawa	60.37	49.82	71.79	69.12	57.93	80.15
Elsunut	68.64	52.77	81.78	78.77	67.40	86.72
Keilik	68.12	56.65	79.03	73.60	65.12	81.95
Es Salam	81.05	75.60	86.82	90.07	84.87	94.36
Babanusa	76.36	61.70	85.46	79.82	65.96	89.08
Abyei	74.05	62.10	84.06	57.04	41.21	71.16

TABLE 72: Treatment-seeking for ARI by locality and by state

Location	Visited health facility for ARI %			Provided treatment for ARI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Dibab	76.92	60.00	89.93	77.55	57.89	89.83
El Meiram	75.00	64.18	82.72	68.60	59.26	79.25
West Kordofan State	64.13	52.85	75.42	75.38	65.37	85.38
El Fasher	81.62	71.14	88.24	80.47	73.38	85.90
Tawila	46.79	24.21	65.74	48.59	26.35	67.49
Melit	63.03	52.04	72.35	59.69	49.67	69.24
Um Kadada	58.81	50.61	66.05	77.36	70.68	83.46
Kebkabiya	91.03	85.20	95.91	85.84	78.84	91.26
Kutum	71.97	59.99	84.08	71.43	60.13	84.27
El Mahalha	62.02	47.28	72.15	59.73	42.73	72.16
Saraf Omra	78.70	59.38	89.76	75.40	55.33	87.01
El Serief	27.04	19.35	34.45	26.62	19.90	34.89
Dar Elsalam	55.81	41.65	72.09	69.12	54.81	82.18
Kelemando	74.62	62.71	84.33	89.70	83.49	94.94
El Tawisha	48.33	34.75	61.25	78.10	70.37	85.11
Um Baru	56.82	46.66	66.23	72.46	63.81	79.47
El Lait	67.88	53.01	80.01	78.53	68.87	88.48
ELkuma	90.91	74.27	100.00	92.31	66.15	100.00
El Tina	0.00	0.00	0.00	0.00	0.00	0.00
Kernoi	79.96	71.66	86.86	88.70	81.83	93.25
North Darfur State	66.95	56.00	77.90	69.51	58.71	80.31
Nyala South	72.00	63.08	81.68	80.19	71.05	88.28
Nyala North	84.54	75.34	94.31	93.94	83.53	100.00
Es Salam	84.11	69.85	95.73	78.81	64.84	91.82
El Wihda	53.57	41.16	66.31	40.79	27.11	54.94
Mershing	77.22	65.89	85.09	58.33	38.14	73.93
Beliel	72.59	65.68	78.43	73.79	65.95	81.55
Nitega	88.80	80.48	95.32	79.10	69.23	86.81
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00
Kas	41.82	29.35	56.24	68.01	57.19	77.41
Shattaya	44.95	31.16	57.78	59.60	47.19	71.63
Buram	61.06	47.26	74.48	62.80	49.71	77.22
Gereida	91.04	83.97	95.34	92.21	86.54	96.05
El Sunta	72.87	62.08	84.69	69.81	58.51	80.19
El Radoum	34.52	24.93	46.84	57.49	48.09	66.79
Tulus	48.57	21.41	73.91	61.54	37.50	86.80

TABLE 72: Treatment-seeking for ARI by locality and by state

Location	Visited health facility for ARI %			Provided treatment for ARI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Damso	62.86	41.90	75.94	81.52	65.07	93.91
Ed Elfursan	70.45	52.82	84.98	61.21	44.04	72.22
Kubum	80.65	68.48	92.04	74.38	58.47	85.91
Kateila	47.97	32.52	67.61	45.97	30.05	64.22
Rehaid Elbirdi	61.82	49.89	74.39	83.72	77.78	89.10
Um Dafoug	55.16	45.66	62.00	72.58	63.51	79.67
South Darfur State	65.00	50.57	79.43	71.42	58.11	84.73
Abu Jabra	47.13	30.15	65.54	57.61	41.13	71.91
Abu Karinka	66.67	46.38	88.80	77.59	60.92	90.30
Bahr El Arab	9.38	0.00	34.83	9.38	0.00	33.41
Adila	86.41	72.59	95.32	82.39	68.08	91.69
Ed Dain	54.55	39.02	69.12	76.11	63.44	86.13
Assalaya	40.35	16.65	67.81	77.94	63.12	88.68
El Firdous	77.78	33.33	100.00	57.14	0.00	100.00
Shia-ria	NA	NA	NA	50.00	0.00	88.89
Yassin	71.59	51.28	84.55	73.00	51.25	87.77
East Darfur State	53.35	27.57	79.14	60.82	33.29	88.35
El Geneina	75.52	66.74	85.40	76.25	67.45	84.85
Habila	16.29	4.41	33.34	24.19	8.02	51.57
Kulbus	54.14	35.99	71.30	64.52	51.23	75.78
Beida	71.43	48.46	90.26	83.33	66.67	97.44
Foro Baranga	26.58	8.33	72.26	31.58	13.84	75.59
Kereneik	63.55	55.29	71.93	63.46	54.77	72.88
Sirba	63.54	48.81	74.11	62.79	51.15	71.44
Jebel Moon	45.05	31.68	61.79	57.92	45.25	70.91
West Darfur State	62.88	58.41	67.75	64.05	58.67	68.77
Zalingi	54.81	45.48	65.75	69.52	60.13	77.87
Wadi Salih	50.94	28.56	81.94	52.94	30.00	84.70
Mukjar	77.78	46.64	100.00	82.86	53.85	100.00
Central Jebel Mara	85.83	64.66	96.95	82.00	63.64	94.26
North Jebel Mara	31.89	20.95	46.39	30.20	20.42	43.36
Bendasi	51.39	32.06	72.07	71.01	48.49	87.76
Nertiti	84.98	75.67	92.96	81.56	70.15	90.19
Azum	63.93	50.44	73.78	66.15	51.14	76.39
Um Dukhun	10.39	2.24	21.82	25.00	14.14	39.62
Central Darfur State	55.98	38.24	73.72	61.32	43.18	79.47

Spatial distribution of treatment-seeking for ARI

The moderately high proportion of children with ARI who were brought to a health facility was fairly evenly spread throughout Sudan, although parts of the Darfur states and the North and West Kordofan states had pockets of low health facility visits for ARI *(see Figure 251)*. The same spatial pattern was noted for the proportion of children who received treatment for ARI at a health facility *(see Figure 253)*.

FIGURE 251:
Child: Visited health facility for ARI (raster)

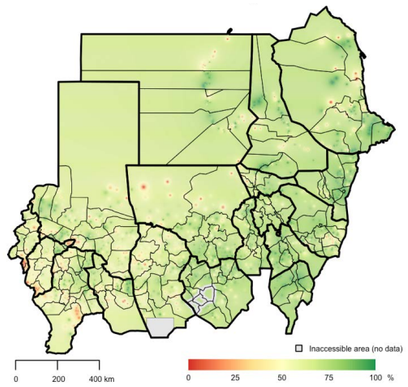


FIGURE 252:
Child: Visited health facility for ARI

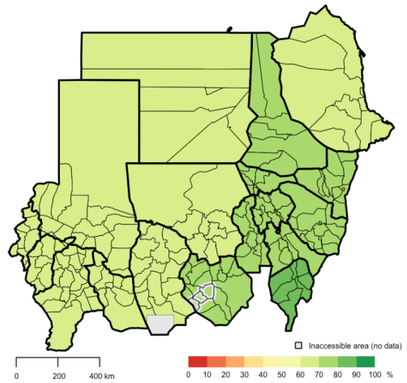


FIGURE 253:
Child: Provided treatment for ARI (raster)

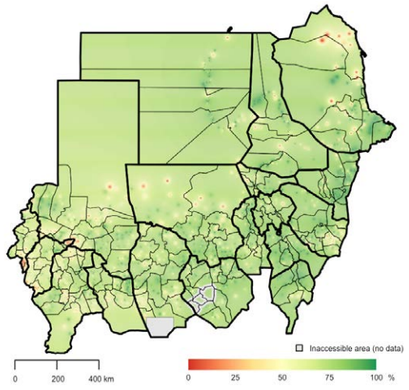
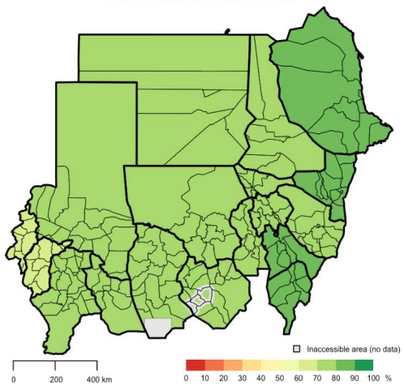


FIGURE 254:
Child: Provided treatment for ARI



3.11 Antenatal (ANC) and postnatal care coverage

The current approach to antenatal care (ANC) service provision recommends at least four ANC visits that provide essential, evidence-based interventions. As a package, this is called focused antenatal care or FANC (Campbell, Graham and Lancet Maternal Survival Series steering group 2006; Carroli et al., 2001; Langer et al., 2002; Lincetto et al. 2006; Villar et al., 2001; Zahr and Wardlaw 2003; Sanghvi, Harvey and Wainwright 2010).

Iron supplementation during pregnancy is meant to prevent and/or treat iron-deficiency and anaemia in pregnant women. Iron-deficiency anaemia significantly increases the risk of maternal mortality and morbidity, particularly during childbirth (Sloan, Jordan and Winikoff, 2002; Stoltzfus, 2001). Iron supplementation (of which ferrous sulphate is a common type) for pregnant women has been shown to effectively increase their haemoglobin levels, rendering them less susceptible to mortality and morbidity during childbirth (Kulier et al., 1998; Menendez et al., 1994; Zerfu and Ayele, 2013).

Folate is a critical building block used by the body to synthesize nucleotides and as such has an influence on embryonic development. Folic acid supplementation during the peri-conceptional and perinatal periods has been shown to reduce the occurrence of neural tube defects (Barua, Kuizon and Junaid 2014; Sanghvi, Harvey and Wainwright, 2010), congenital heart defects and orofacial clefts (Bailey and Berry, 2005).

The four-visit ANC coverage indicator, plus iron and folic acid supplementation indicators, are used in the S3M II surveys as proxies for assessing the content and quality of ANC coverage.

ANC visits: Time of first visit average results

Table 73 and Table 74 present indicator results related to ANC visits for a carer's most recent pregnancy. Gestational age in months at the first ANC visit reflects how early pregnant women seek ANC, with the expectation that pregnant women should come for their first ANC consultation at a gestational age of 2-3 months. At this gestational age, interventions such as iron-folic acid supplementation can be started immediately, offering the mother and her unborn child the best possible preventative and therapeutic benefits.

The Sudan results indicated that pregnant women in Sudan came for their first ANC visit on average at 3.4 (95 per cent CI 3.1-3.8) months into gestation.

Among the states, pregnant women from Red Sea state were the latest to attend their first ANC visit at 4.4 (95 per cent CI 3.9-4.9) months, while those from Khartoum and Northern state were the earliest at 2.8 (95 per cent CI 2.5-3.0) months and 2.7 (95 per cent CI 2.3-3.1) months respectively. The states' results for gestational age in months at first ANC visit was evenly distributed with no outliers *(see Figure 255).*

Among the localities, pregnant women from Sinkat and Gabaot Elma-aadin localities in Red Sea state and Sharg El Jabal (accessible parts) locality in South Darfur state attended their first ANC visit at the latest time, at 6.65 (95 per cent CI 6.33-7.01) months, 5.61 (95 per cent CI 5.05-6.1) months, and 6.12 (95 per cent CI 4.39-7.43) months respectively. These three localities had significantly later first ANC visits than all other localities in Sudan *(see Figure 255).* On the other hand, pregnant women from Rural Western Kassala in Kassala state and Kebkabiya in North Darfur state attended their first ANC visit at the earliest point in their pregnancies at 1.93 (95 per cent CI 1.68-2.2) months, and 1.62 (95 per cent CI 1.48-1.74) months respectively. These two localities had significantly earlier first ANC visits than all other localities in Sudan *(see Figure 255).*

FIGURE 255: Box plot of state and locality results of gestational age in months at first ANC visit for most recent pregnancy

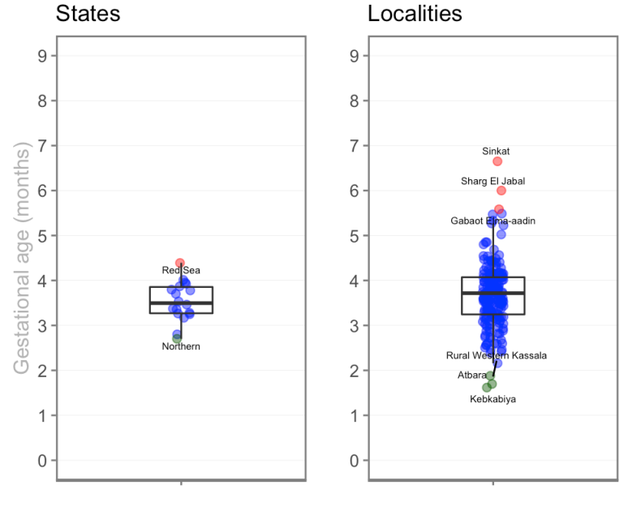
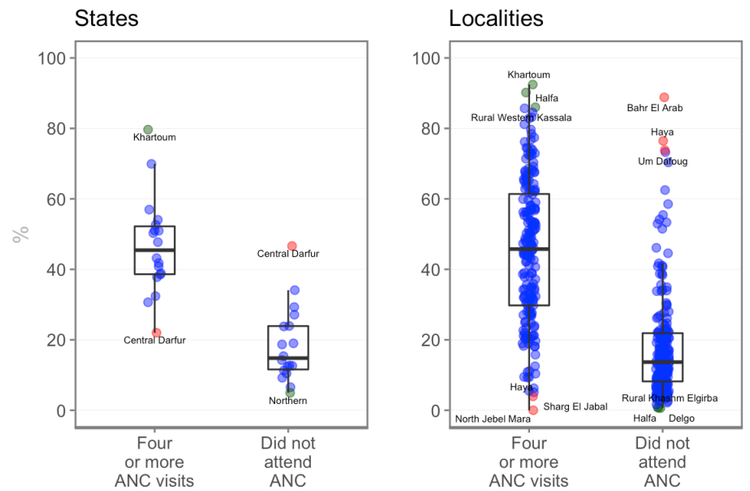


FIGURE 256: Box plot of state and locality results of ANC non-attendance and attendance to four or more ANC visits



ANC visit non-attendance average results

Non-attendance to ANC visits is an important non-coverage indicator. Those implementing ANC programs should aim to keep this indicator as low as possible and to treat any non-coverage case as a critical incident requiring immediate action.

The Sudan S3M II results showed that non-attendance to ANC visits was relatively high at 16.2 per cent (95 per cent CI 8.9-23.5 percent).

Among the states, Central Darfur had the highest rate of ANC non-attendance at 46.6 per cent (95 per cent CI 34.2-59.0 percent), while Northern state had the lowest rate at 4.9 per cent (95 per cent CI 1.2-8.7 percent).

Across the localities, ANC non-attendance was worryingly high, with up to 17 localities with ANC non-attendance rates above 40 per cent. Most of the localities with high non-attendance were located in South Darfur (six localities) and Central Darfur (five localities), with two localities in West Darfur and one each in Al-Gadarif, Blue Nile, East Darfur and Red Sea. The lowest rate of ANC non-attendance was in Rural Khashm Elgirba locality in Kassala state at 1.25 per cent (95 per cent CI 0-4.21 percent).

ANC attendance: Four visits average results

Attendance at four or more ANC visits is a proxy for coverage of services needed by a pregnant women and her unborn child. Attendance at four or more ANC visits during pregnancy was 51.2 per cent (95 per cent CI 42.3-60.2 per cent) for the whole of Sudan, a rate that is not as high as it should be.

Across the states, Khartoum had the highest prevalence of pregnant women attending four or more ANC visits at 79.6 per cent (95 per cent CI 73.0-86.3 percent), while Central Darfur state had the lowest at 22.0 per cent (95 per cent CI 14.0-30.0 percent).

Among the localities, the prevalence of pregnant women attending four or more ANC sessions was evenly spread over an extremely wide range, from the highest level in Khartoum locality in Khartoum state at 92.25 per cent (95 per cent CI 88.38-95.68 percent), to the lowest levels in Sharg El Jabal (accessible parts) and North Jebel Mara localities in South Darfur and Central Darfur state respectively, both at 0 per cent (95 per cent CI 0- 0 percent).

TABLE 73: ANC visits

State	Gestational age at first ANC visit (months)			Number of ANC visits			Did not attend ANC %			Attended four or more ANC visits %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	3.46	3.06	3.87	3.09	2.63	3.54	18.65	10.49	26.82	38.53	29.01	48.05
Al-Gazeera	3.17	2.85	3.49	4.06	3.54	4.59	12.38	6.83	17.93	54.06	44.41	63.71
Blue Nile	3.35	3.09	3.61	3.24	2.63	3.85	23.94	12.99	34.89	40.79	30.77	50.80
Central Darfur	3.87	3.45	4.29	1.93	1.41	2.45	46.64	34.27	59.01	21.98	13.99	29.97
East Darfur	3.80	3.36	4.24	2.50	2.10	2.90	34.09	25.93	42.25	32.42	24.13	40.72
Kassala	4.01	3.67	4.35	3.85	3.35	4.36	10.46	4.64	16.27	51.05	40.61	61.49
Khartoum	2.80	2.55	3.04	5.42	4.96	5.88	6.54	2.46	10.62	79.63	72.95	86.30

TABLE 73: ANC visits

State	Gestational age at first ANC visit (months)			Number of ANC visits			Did not attend ANC %			Attended four or more ANC visits %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
North Darfur	3.71	3.31	4.10	3.06	2.63	3.49	18.99	10.02	27.96	38.88	28.49	49.26
North Kordofan	3.53	3.20	3.86	4.11	3.67	4.56	9.24	5.31	13.18	56.96	48.68	65.24
Northern	2.70	2.31	3.08	4.63	4.16	5.11	4.94	1.23	8.65	69.91	60.78	79.03
Red Sea	4.39	3.93	4.86	2.77	2.32	3.22	29.31	20.62	37.99	30.63	22.81	38.44
River Nile	3.29	2.94	3.63	3.52	3.14	3.89	11.32	5.54	17.10	50.94	42.75	59.12
Sennar	3.25	2.87	3.63	3.59	3.14	4.03	15.37	8.40	22.35	47.70	38.93	56.46
South Darfur	3.78	3.43	4.12	3.05	2.46	3.64	27.14	15.71	38.57	41.79	31.28	52.29
South Kordofan	3.92	3.61	4.23	3.63	3.12	4.14	12.70	6.32	19.09	50.30	40.41	60.20
West Darfur	3.26	2.94	3.59	3.11	2.58	3.65	23.80	14.70	32.90	43.17	31.94	54.40
West Kordofan	3.95	3.65	4.26	3.12	2.71	3.52	14.24	8.06	20.41	37.80	29.16	46.43
White Nile	3.37	3.03	3.71	3.93	3.47	4.39	12.62	6.96	18.29	52.59	44.82	60.36
Sudan	3.44	3.10	3.79	3.77	3.29	4.26	16.20	8.93	23.48	51.24	42.27	60.21

TABLE 74: ANC visits by locality and by state

Location	Gestational age at first ANC visit (months)			Number of ANC visits			Did not attend ANC %			Attended four or more ANC visits %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	2.75	2.51	3.12	5.01	4.56	5.41	2.98	1.20	5.21	73.93	65.58	82.12
El Golid	2.96	2.74	3.20	4.73	4.40	5.03	4.28	1.81	7.47	77.89	70.79	82.93
Merwoe	2.53	1.95	3.25	3.81	3.20	4.42	11.14	5.86	17.82	50.90	40.52	62.04
El Daba	2.85	2.70	3.03	4.82	4.43	5.26	2.59	0.93	4.93	73.54	63.67	82.67
Halfa	2.52	2.36	2.72	6.04	5.78	6.32	2.61	0.52	5.56	88.76	84.15	92.78
Delgo	2.73	2.45	3.06	5.37	4.99	5.81	1.35	0.00	3.75	80.96	74.60	86.81
El Burgaig	2.39	2.22	2.61	4.22	3.88	4.56	3.84	1.69	6.36	69.98	63.36	76.53
Northern State	2.70	2.31	3.08	4.63	4.16	5.11	4.94	1.23	8.65	69.91	60.78	79.03
El Matama	3.63	3.26	4.02	3.67	3.36	3.98	7.63	3.71	11.70	51.54	44.01	58.94
Shendi	3.52	3.12	4.04	3.34	2.97	3.67	8.29	4.37	13.20	45.85	36.23	53.57
Abu Hamad	3.50	3.13	3.94	2.22	1.75	2.71	30.09	21.06	39.98	27.68	18.88	37.49
Barbar	3.88	3.49	4.17	3.10	2.73	3.48	8.60	4.29	13.73	44.87	36.68	52.93
El Damar	2.98	2.79	3.20	3.97	3.59	4.29	10.85	5.51	17.25	59.71	53.27	66.40
Atbara	2.03	1.82	2.28	4.72	4.37	5.05	5.51	2.87	8.26	76.78	70.08	82.86
El Buhaira	3.81	3.59	4.09	2.50	2.19	2.80	16.84	11.33	23.72	26.61	20.36	33.34

TABLE 74: ANC visits by locality and by state

Location	Gestational age at first ANC visit (months)			Number of ANC visits			Did not attend ANC %			Attended four or more ANC visits %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
River Nile State	3.29	2.94	3.63	3.52	3.14	3.89	11.32	5.54	17.10	50.94	42.75	59.12
Khartoum	2.17	1.97	2.38	6.50	6.12	6.81	3.00	1.21	6.87	92.25	88.38	95.68
Bahri	2.60	2.39	2.91	5.28	4.61	5.83	6.54	2.19	12.61	73.21	63.78	80.82
Um Durman	2.91	2.63	3.25	5.64	5.17	6.10	6.37	3.63	10.09	79.72	75.00	84.63
Um Bada	2.98	2.75	3.32	5.43	4.92	5.98	7.25	2.84	13.13	81.03	74.12	88.48
Jebel Awlia	2.44	2.18	2.66	5.05	4.68	5.37	9.83	6.17	14.22	74.30	68.57	80.39
Sharg Elneel	3.43	3.17	3.74	4.74	4.34	5.12	8.10	4.20	11.87	73.21	65.12	80.66
Karrari	2.89	2.72	3.10	5.74	5.43	6.10	3.40	1.30	6.07	85.01	79.88	89.91
Khartoum State	2.80	2.55	3.04	5.42	4.96	5.88	6.54	2.46	10.62	79.63	72.95	86.30
Greater Medani	2.56	2.34	2.77	4.99	4.44	5.47	8.87	5.41	12.99	67.62	60.19	75.73
Ganub Elgazira	2.74	2.40	3.15	4.71	4.07	5.43	5.09	1.80	10.21	61.30	50.33	72.38
El Hassahisa	3.36	3.09	3.62	4.14	3.64	4.62	10.94	5.64	18.96	60.99	51.62	70.10
El Kamlin	3.17	2.89	3.48	4.39	3.88	4.91	8.56	4.49	13.67	65.55	54.36	75.47
Sharg El Gezira	3.26	2.96	3.60	4.27	3.81	4.64	8.89	4.17	16.67	55.93	47.49	62.22
Um Elqura	3.80	3.38	4.22	3.62	3.21	4.13	12.97	8.23	19.92	45.25	37.59	53.94
El Manaqil	3.27	2.93	3.66	3.24	2.78	3.69	24.24	18.69	31.05	39.11	29.96	48.63
El Qurashi	3.36	3.06	3.65	3.71	3.28	4.14	9.15	4.91	15.33	47.61	38.85	57.02
Al-Gazeera State	3.17	2.85	3.49	4.06	3.54	4.59	12.38	6.83	17.93	54.06	44.41	63.71
Sennar	2.48	2.28	2.70	5.23	4.72	5.67	5.63	2.93	9.70	74.65	64.41	81.33
Sharg Sennar	3.80	3.32	4.26	1.92	1.41	2.49	37.97	25.57	50.00	22.57	14.01	32.41
Sinja	2.60	2.37	2.87	4.97	4.58	5.32	4.30	2.10	7.06	70.76	63.36	76.50
Abu Hujar	3.96	3.45	4.37	2.79	2.35	3.41	14.58	8.24	21.35	31.46	22.99	41.31
El Dali	3.62	3.35	3.97	3.09	2.59	3.63	18.22	11.74	24.77	40.48	32.25	48.61
Es Suki	3.02	2.76	3.31	3.87	3.41	4.44	9.57	4.98	16.30	55.06	43.88	66.22
Ed Dinder	3.95	3.50	4.43	2.35	2.03	2.63	18.72	12.28	26.18	23.08	16.67	30.31
Sennar State	3.13	2.99	3.30	3.80	3.52	4.08	13.53	10.41	17.08	51.34	46.02	56.37
Ed Damazine	2.68	2.45	2.97	4.64	3.89	5.32	16.80	11.38	23.95	60.21	49.36	69.50
El Tadamon	2.51	2.37	2.61	2.27	2.15	2.39	6.93	3.95	9.98	10.59	5.89	16.75
El Roseiris	3.27	3.00	3.54	3.46	2.76	4.00	25.67	17.50	35.72	50.41	40.58	59.43
Baw	4.35	4.04	4.60	2.23	1.53	2.71	31.36	15.29	52.40	19.82	13.37	25.66
Geisan	3.17	3.00	3.37	3.65	2.75	4.46	16.67	4.06	33.33	55.53	39.26	67.93
El Kurmuk	3.83	3.57	4.19	2.80	2.16	3.33	22.86	14.86	33.62	34.29	23.19	46.57
Wad El Mahi	3.85	3.58	4.15	2.03	1.52	2.56	45.02	31.39	58.71	26.61	17.13	35.96
Blue Nile State	3.35	3.09	3.61	3.24	2.63	3.85	23.94	12.99	34.89	40.79	30.77	50.80
Kosti	3.28	2.97	3.66	4.35	3.92	4.85	9.71	4.80	15.55	60.86	52.37	69.02
Guli	3.72	3.34	4.15	2.84	2.50	3.25	19.55	13.69	25.77	30.75	23.79	37.28

TABLE 74: ANC visits by locality and by state

Location	Gestational age at first ANC visit (months)			Number of ANC visits			Did not attend ANC %			Attended four or more ANC visits %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Tendalti	3.35	3.11	3.60	3.64	3.23	4.08	10.11	4.94	15.78	47.26	40.24	55.65
Es Salam	4.31	3.97	4.64	2.82	2.47	3.15	13.88	8.58	20.24	31.91	24.59	39.47
Rabak	2.94	2.63	3.24	4.75	4.27	5.27	14.03	9.79	17.74	59.52	52.58	65.94
El Jabalain	3.93	3.56	4.31	3.73	3.30	4.14	12.45	8.07	18.17	52.63	43.04	60.86
El Diwaim	3.17	2.87	3.55	3.01	2.54	3.51	23.53	15.19	33.20	35.19	28.93	43.52
Um Rimta	2.77	2.48	3.17	4.63	4.24	4.94	7.35	4.58	11.75	66.81	60.52	73.23
El Gitaina	3.42	3.17	3.75	4.56	4.24	4.90	3.84	1.42	7.25	69.90	62.20	76.73
White Nile State	3.37	3.03	3.71	3.93	3.47	4.39	12.62	6.96	18.29	52.59	44.82	60.36
Port Sudan	2.87	2.52	3.30	5.85	5.34	6.32	4.86	1.94	8.61	79.83	72.15	86.21
Swakin	3.03	2.65	3.45	3.87	3.20	4.41	13.09	5.21	24.57	64.89	55.08	75.33
El Gonob Welawlaib	5.21	5.00	5.45	2.65	2.31	2.95	10.72	4.79	19.10	28.94	19.58	37.86
Sinkat	6.65	6.33	7.01	1.83	1.44	2.26	26.67	17.33	38.47	9.68	5.33	14.45
Haya	3.65	3.00	4.34	0.72	0.38	1.05	75.89	68.26	85.03	3.94	0.69	8.90
Dordieb	5.14	4.68	5.46	1.75	1.24	2.25	34.41	13.84	53.74	10.55	5.53	15.63
Tokar	5.09	4.71	5.51	2.43	2.01	2.87	14.60	8.46	23.66	17.27	9.33	25.73
Agig	4.56	4.32	4.81	2.63	2.19	3.07	12.50	4.94	22.31	20.00	12.25	27.14
Gabaot Elma-aadin	5.61	5.05	6.10	2.69	2.27	3.14	16.31	10.12	23.86	27.09	15.47	38.34
Halaeeb (accessible parts)	5.22	4.70	5.75	2.87	2.26	3.64	20.45	9.99	29.64	30.51	19.41	43.25
Red Sea State	4.39	3.93	4.86	2.77	2.32	3.22	29.31	20.62	37.99	30.63	22.81	38.44
Kassala Town	3.50	3.18	3.82	4.48	4.02	4.95	6.90	4.20	10.10	56.54	46.92	66.68
Refi Kassla	3.83	3.59	4.07	4.01	3.70	4.28	4.03	1.84	7.08	55.96	46.16	62.84
Rural Western Kassala	1.93	1.68	2.20	6.67	6.05	7.26	2.75	1.04	5.42	84.46	75.52	90.52
New Halfa	3.13	2.78	3.51	5.08	4.63	5.64	6.65	3.71	10.72	69.53	61.66	76.69
Refi Nahr Atbara	4.83	4.35	5.44	3.36	2.85	3.90	9.24	4.96	13.87	47.27	33.79	62.61
Rural Khashm Elgirba	3.36	3.12	3.61	4.67	4.33	4.97	1.25	0.00	4.21	78.85	70.58	85.29
Rural Wad Elhilaiw	3.92	3.64	4.21	3.20	2.85	3.63	9.76	4.73	15.96	40.68	31.64	49.22
Rural Aroma	4.87	4.39	5.39	2.60	2.19	3.11	12.84	7.29	18.85	24.95	15.76	37.75
Refi North Delta	4.93	4.64	5.17	2.42	2.07	2.74	20.18	13.85	27.25	22.37	15.14	29.78
Refi Hamashkureib	4.15	3.88	4.41	3.96	3.20	4.71	9.84	3.48	17.25	57.42	42.65	72.37
Rural Telkok	5.05	4.80	5.36	2.29	1.97	2.62	23.31	14.44	34.29	24.01	16.79	30.34
Kassala State	4.01	3.67	4.35	3.85	3.35	4.36	10.46	4.64	16.27	51.05	40.61	61.49
Gedaref Town	2.87	2.58	3.26	4.55	4.18	4.84	7.64	3.30	12.46	64.40	58.03	71.08

TABLE 74: ANC visits by locality and by state

Location	Gestational age at first ANC visit (months)			Number of ANC visits			Did not attend ANC %			Attended four or more ANC visits %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Middle Geddaref	3.37	3.14	3.63	3.40	3.02	3.76	11.21	6.28	17.33	44.58	33.76	56.62
Elbutana	3.84	3.56	4.16	3.25	2.90	3.57	5.50	2.48	9.83	39.51	30.20	48.53
El Fashaga	3.56	3.30	3.77	2.94	2.20	3.53	25.63	17.57	37.10	41.92	30.01	55.23
El Rahad	4.17	3.48	4.70	1.64	1.06	2.27	46.46	30.38	63.77	22.06	14.70	30.27
Gala-a El Nahal	3.55	3.11	3.97	3.29	2.80	3.90	9.15	4.18	16.29	38.74	28.80	50.00
El Fao	3.55	3.30	3.83	2.39	2.05	2.71	21.16	15.00	27.69	22.08	16.27	29.21
El Qureisha	2.93	2.62	3.27	3.57	3.12	4.09	16.67	9.44	24.28	58.13	46.93	68.63
El Mafaza	3.34	2.94	3.81	2.67	2.28	3.04	15.67	10.42	22.77	22.68	15.84	30.13
Basunda	3.10	2.62	3.68	2.93	2.49	3.39	18.03	13.03	23.09	31.97	22.90	41.77
Western Galabat	4.15	3.87	4.44	2.82	2.33	3.27	15.64	8.38	26.36	24.57	16.25	33.20
Eastern Galabat	3.60	3.36	3.85	3.42	2.92	3.87	17.52	11.36	24.05	43.93	33.33	54.56
Al-Gadarif State	3.46	3.06	3.87	3.09	2.63	3.54	18.65	10.49	26.82	38.53	29.01	48.05
Sheikan	3.25	3.05	3.42	4.65	4.31	5.01	7.95	5.32	10.70	66.58	60.10	71.79
Um Rawaba	3.58	3.29	3.93	3.88	3.42	4.31	9.08	5.44	12.61	50.56	42.32	57.29
Um Dam Haj Ahmed	3.26	2.96	3.67	4.42	3.82	4.90	5.20	2.19	8.67	62.37	50.09	74.20
El Rahad	3.02	2.68	3.43	4.74	4.22	5.29	8.86	4.78	13.18	68.95	61.24	75.92
Bara	3.30	3.01	3.61	4.32	3.99	4.69	4.52	2.45	7.10	61.96	54.42	69.67
Gharb Bara	3.86	3.51	4.19	3.97	3.48	4.57	6.24	3.09	10.57	57.89	46.37	69.91
Soudari	4.18	3.78	4.72	2.97	2.48	3.47	17.95	13.19	22.70	35.29	24.66	47.31
Gebrat El Sheikh	3.75	3.44	4.20	3.90	3.36	4.36	11.34	6.48	16.92	54.21	43.06	62.67
North Kordofan State	3.53	3.20	3.86	4.11	3.67	4.56	9.24	5.31	13.18	56.96	48.68	65.24
Kadugli	3.70	3.49	3.91	4.54	4.25	4.80	7.78	4.86	11.40	70.60	66.04	75.55
Reif Shargi	3.85	3.59	4.05	4.03	3.53	4.44	12.32	8.56	17.51	60.50	51.05	68.26
Dilling	3.88	3.48	4.28	3.34	2.48	4.19	19.59	10.16	32.55	44.61	28.50	60.99
El Quoz	3.53	3.28	3.82	4.01	3.69	4.30	8.00	4.53	11.80	57.12	50.09	63.25
Habila	3.88	3.69	4.09	3.27	2.82	3.71	16.93	10.89	22.53	45.72	36.98	55.03
Abassiya	3.76	3.39	4.15	3.58	3.05	4.14	13.64	9.76	18.21	48.72	40.90	57.51
El Rashad	3.61	3.33	3.96	3.70	2.84	4.51	19.03	7.86	32.51	51.36	37.20	62.80
Abu Jubaiha	4.36	4.14	4.62	2.70	2.38	3.03	13.99	10.23	18.87	30.26	22.93	38.57
El Tadamon	4.02	3.67	4.37	2.84	2.45	3.33	18.27	11.90	24.18	33.46	26.52	42.14
Talodi	4.25	3.98	4.57	4.04	3.36	4.55	12.50	6.34	22.06	63.19	46.34	73.06
Ghadeer	4.11	3.71	4.49	4.40	3.63	5.06	5.52	1.42	10.20	65.32	50.14	77.03
El Leri	4.55	4.36	4.82	4.13	3.81	4.42	7.23	4.41	11.00	64.86	57.54	70.83
Abu Karshola	3.70	3.53	3.88	4.37	4.03	4.71	4.46	2.07	8.64	62.39	55.65	68.15
Delami	3.74	3.48	4.03	3.82	3.21	4.53	10.36	2.39	22.67	57.14	43.47	69.09

TABLE 74: ANC visits by locality and by state

Location	Gestational age at first ANC visit (months)			Number of ANC visits			Did not attend ANC %			Attended four or more ANC visits %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Kordofan State	3.92	3.61	4.23	3.63	3.12	4.14	12.70	6.32	19.09	50.30	40.41	60.20
Abu Zabad	3.86	3.56	4.10	3.76	3.40	4.11	6.69	3.97	10.40	48.53	39.84	57.04
ElKhiwai	4.11	3.82	4.44	3.46	2.99	3.92	7.32	4.14	12.06	38.28	30.61	47.23
Ghubaish	3.68	3.37	4.01	3.30	2.72	3.89	14.58	8.93	21.27	40.08	28.56	49.45
El Nuhud	4.02	3.76	4.32	2.62	2.35	2.85	14.36	10.34	18.98	25.39	20.20	30.85
El Idia	3.87	3.58	4.18	3.14	2.80	3.49	13.49	9.98	18.72	39.96	31.86	46.83
Wad Benda	4.12	3.79	4.46	2.77	2.17	3.35	20.49	13.07	28.78	31.79	21.33	41.99
Lagawa	4.10	3.84	4.41	3.77	3.30	4.16	10.94	6.58	17.17	52.57	43.28	61.02
Elsunut	3.94	3.73	4.15	3.41	2.99	3.80	9.72	4.27	17.52	45.94	35.12	56.05
Keilik	4.14	3.90	4.39	4.09	3.74	4.37	6.23	3.37	9.84	57.76	50.48	63.95
Es Salam	3.42	3.16	3.67	3.53	3.21	3.93	14.70	11.13	18.50	43.36	36.04	50.02
Babanusa	4.14	3.93	4.39	3.13	2.84	3.46	10.94	7.82	15.29	42.95	36.38	51.17
Abyei	3.91	3.63	4.30	3.03	2.73	3.38	12.59	8.83	16.92	38.03	30.79	46.51
El Dibab	4.25	3.84	4.59	2.76	2.35	3.16	18.72	9.66	28.72	28.33	22.05	36.49
El Meiram	4.24	3.89	4.53	2.24	1.75	2.88	34.48	22.27	45.51	31.64	21.52	46.04
West Kordofan State	3.95	3.65	4.26	3.12	2.71	3.52	14.24	8.06	20.41	37.80	29.16	46.43
El Fasher	3.52	3.25	3.80	4.08	3.67	4.52	11.59	8.34	15.49	54.74	48.37	61.94
Tawila	3.95	3.55	4.40	3.30	2.56	4.11	19.36	10.57	31.61	45.33	31.81	60.79
Melit	3.86	3.61	4.21	2.76	2.38	3.14	18.01	11.06	28.31	32.47	25.00	40.39
Um Kadada	3.58	3.37	3.81	3.66	3.15	4.06	15.39	10.69	20.66	54.02	41.20	63.78
Kebkabiya	1.62	1.48	1.74	2.85	2.53	3.16	20.09	15.21	25.70	45.45	35.43	55.53
Kutum	3.91	3.62	4.21	3.76	3.26	4.24	17.69	11.23	24.72	58.65	48.45	69.21
El Mahalha	3.53	3.13	3.99	2.59	2.11	3.12	22.22	12.99	35.76	29.26	17.87	41.28
Saraf Omra	4.29	3.76	4.77	2.18	1.72	2.68	35.04	25.49	44.61	27.95	16.80	41.10
El Serief	4.57	4.22	4.89	2.00	1.62	2.36	37.67	30.03	45.85	18.60	13.80	24.32
Dar Elsalam	3.51	3.31	3.72	3.06	2.82	3.37	12.38	8.79	16.67	36.07	29.37	42.52
Kelemando	3.63	3.35	3.95	3.09	2.67	3.57	14.90	9.38	22.68	35.70	26.12	46.80
El Tawisha	4.39	4.15	4.65	2.18	1.98	2.46	22.41	16.34	28.01	19.67	15.49	23.74
Um Baru	4.35	3.76	4.78	3.08	2.73	3.53	6.80	2.27	13.07	27.03	19.60	41.11
El Lait	3.60	3.21	3.98	2.63	2.36	2.95	23.63	18.14	29.41	30.44	23.78	35.84
ELkuma	4.41	3.88	4.85	3.22	2.60	3.61	9.48	4.31	18.08	43.26	27.43	57.44
El Tina	4.43	3.43	5.60	1.89	1.00	2.78	22.22	0.00	55.56	11.11	0.00	33.33
Kernoi	4.15	3.87	4.42	3.16	2.84	3.51	15.38	11.11	20.73	39.34	31.93	47.21
North Darfur State	3.71	3.31	4.10	3.06	2.63	3.49	18.99	10.02	27.96	38.88	28.49	49.26
Nyala South	3.16	2.98	3.36	4.45	4.08	4.76	11.29	7.81	15.81	66.50	60.79	71.22

TABLE 74: ANC visits by locality and by state

Location	Gestational age at first ANC visit (months)			Number of ANC visits			Did not attend ANC %			Attended four or more ANC visits %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nyala North	3.39	2.96	4.17	3.64	2.62	4.49	16.54	4.50	34.88	56.88	38.81	74.00
Es Salam	3.67	3.47	3.91	3.75	3.27	4.11	10.79	6.43	16.74	53.16	43.73	61.21
El Wihda	3.78	3.42	4.10	3.27	2.79	3.72	15.67	8.31	25.90	43.24	34.05	51.53
Mershing	4.40	4.08	4.72	4.66	4.15	5.08	9.10	4.25	16.09	68.27	56.26	76.47
Beliel	3.54	3.39	3.68	5.17	4.93	5.40	2.35	1.26	4.34	83.35	78.95	87.18
Nitega	3.23	3.00	3.50	4.14	3.63	4.52	12.71	7.95	19.56	60.95	50.24	70.31
Sharg El Jabal (accessible parts)	6.13	4.39	7.43	1.00	0.46	1.67	53.33	33.33	80.00	0.00	0.00	0.00
Kas	3.42	3.17	3.71	3.52	2.99	3.98	19.08	12.59	26.67	48.53	39.28	56.55
Shattaya	3.53	3.18	4.00	2.82	1.92	3.51	28.82	16.54	42.00	39.59	24.55	51.88
Buram	4.47	4.23	4.78	1.82	1.49	2.15	53.70	45.75	62.76	19.89	14.98	25.39
Gereida	3.18	3.02	3.38	4.91	4.19	5.41	9.65	4.88	19.37	74.86	64.73	83.37
El Sunta	4.06	3.80	4.33	2.48	1.87	3.14	30.03	18.17	42.38	32.01	20.90	43.35
El Radoum	3.82	3.42	4.30	2.15	1.48	2.87	43.70	28.97	56.63	28.60	16.90	42.80
Tulus	4.05	3.65	4.44	2.59	2.10	3.52	29.68	12.39	42.49	32.65	24.54	47.47
Damso	3.75	3.46	4.16	2.66	1.74	3.30	31.86	19.36	48.79	34.71	23.46	48.27
Ed Elfursan	4.11	3.86	4.35	2.06	1.68	2.40	33.63	24.24	44.19	17.93	12.35	25.51
Kubum	3.85	3.64	4.09	2.97	2.57	3.34	22.03	15.80	30.50	38.18	29.68	46.16
Kateila	3.97	3.66	4.33	1.94	1.50	2.43	41.49	30.03	50.42	20.73	12.91	29.06
Rehaid Elbirdi	4.19	3.93	4.51	2.15	1.50	2.81	44.10	30.83	60.10	31.63	20.08	45.16
Um Dafoug	4.43	3.96	4.92	0.67	0.35	1.14	74.38	61.70	85.54	5.76	2.01	11.14
South Darfur State	3.78	3.43	4.12	3.05	2.46	3.64	27.14	15.71	38.57	41.79	31.28	52.29
Abu Jabra	4.12	3.75	4.46	3.12	2.56	3.56	20.30	13.18	29.34	42.20	32.12	51.17
Abu Karinka	3.87	3.67	4.07	3.26	2.85	3.66	10.61	4.24	17.69	40.91	30.94	50.90
Bahr El Arab	3.32	2.50	4.09	0.38	0.13	0.65	89.31	81.55	95.34	5.02	1.59	9.72
Adila	3.72	3.34	4.25	1.93	1.48	2.31	35.36	24.07	46.12	20.66	10.75	30.26
Ed Dain	3.36	3.14	3.64	4.31	3.94	4.73	10.52	6.54	15.07	64.59	56.42	70.34
Assalaya	4.55	4.20	4.85	2.50	2.19	2.88	26.39	20.33	32.91	27.52	20.65	34.39
El Firdous	4.33	4.00	4.66	2.00	1.61	2.44	36.20	26.64	48.32	21.49	15.27	29.10
Shia-ria	3.03	2.65	3.36	3.85	3.37	4.37	17.88	13.48	22.34	55.49	46.37	65.15
Yassin	3.90	3.65	4.10	2.83	2.28	3.40	27.95	18.36	39.66	42.10	30.77	52.69
East Darfur State	3.80	3.36	4.24	2.50	2.10	2.90	34.09	25.93	42.25	32.42	24.13	40.72
El Geneina	3.02	2.76	3.36	3.95	3.47	4.42	15.18	9.19	22.56	54.13	45.35	63.30
Habila	3.57	3.06	3.99	1.98	1.47	2.50	42.71	33.19	55.56	24.90	16.77	34.41
Kulbus	3.45	3.05	3.87	3.06	2.33	3.64	17.90	8.94	28.09	45.22	28.19	60.32

TABLE 74: ANC visits by locality and by state

Location	Gestational age at first ANC visit (months)			Number of ANC visits			Did not attend ANC %			Attended four or more ANC visits %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Beida	2.64	2.49	2.82	2.36	1.94	2.86	18.86	10.13	29.63	13.07	5.95	23.08
Foro Baranga	3.69	3.40	4.01	1.75	1.44	2.11	58.33	51.42	65.82	25.63	20.53	31.67
Kereneik	3.56	3.37	3.75	3.94	3.69	4.21	11.53	8.43	15.54	58.03	52.52	63.19
Sirba	3.03	2.78	3.31	3.05	2.52	3.57	20.18	11.69	32.89	44.59	33.26	55.54
Jebel Moon	3.52	3.17	3.87	2.39	1.58	3.25	35.62	20.09	51.47	37.77	19.32	56.69
West Darfur State	3.26	2.94	3.59	3.11	2.58	3.65	23.80	14.70	32.90	43.17	31.94	54.40
Zalingi	2.65	2.46	2.79	4.07	3.55	4.55	18.88	12.80	26.18	57.86	49.62	65.92
Wadi Salih	3.19	2.99	3.38	1.26	0.87	1.66	52.57	39.98	65.06	9.32	5.30	15.69
Mukjar	4.08	3.72	4.77	0.98	0.33	1.92	72.19	49.99	87.56	6.81	0.92	14.29
Central Jebel Mara	4.48	4.03	5.04	2.89	2.21	3.64	26.43	15.79	37.69	34.78	21.52	46.67
North Jebel Mara	5.27	4.66	5.97	0.82	0.56	1.07	61.97	47.82	74.50	0.00	0.00	0.00
Bendasi	4.12	3.64	4.58	0.77	0.40	1.15	74.17	62.17	87.38	9.30	4.32	14.11
Nertiti	3.34	2.98	3.62	3.65	2.91	4.28	13.45	6.34	22.43	51.71	41.49	63.51
Azum	3.57	3.38	3.78	2.46	1.81	2.97	27.09	14.10	39.22	31.08	21.74	39.65
Um Dukhun	3.89	3.49	4.21	1.45	1.09	1.86	55.29	44.36	66.98	18.05	11.25	25.25
Central Darfur State	3.87	3.45	4.29	1.93	1.41	2.45	46.64	34.27	59.01	21.98	13.99	29.97

Spatial distribution of ANC visits

There was an even spatial spread of early gestational age at first ANC visit for the most recent pregnancy with small pockets of late presentation for ANC visits in central areas of Red Sea state and Western areas of Kassala state *(see Figure 257)*.

The lowest number of ANC visits during the most recent pregnancy was found predominantly in the east, northeast, west and southwest of Sudan, and it increased toward the center of Sudan. Pockets of the highest number of ANC visits were found in the central areas of Kassala state, most of Port Sudan in Red Sea state, most of Khartoum state, southern areas of North Kordofan state and central areas of Northern state *(see Figure 259)*.

Low non-attendance to ANC was evenly spread throughout Sudan, but with small pockets of high rates of non- attendance in parts of Red Sea state, Central Darfur, South Darfur and East Darfur *(see Figure 261)*.

Attendance to four or more ANC sessions followed the same spatial pattern as the number of ANC visits *(see Figure 263)*.

FIGURE 257:
ANC: Gestational age (in months) at first ANC visit for most recent pregnancy (raster)

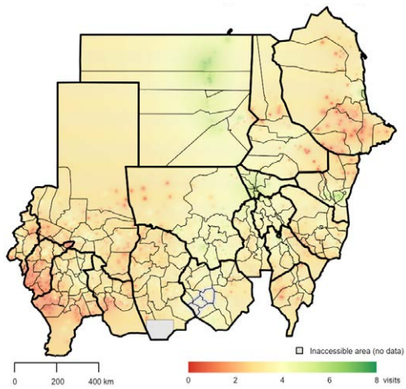


FIGURE 258:
ANC: Gestational age (months) at first ANC visit for most recent pregnancy

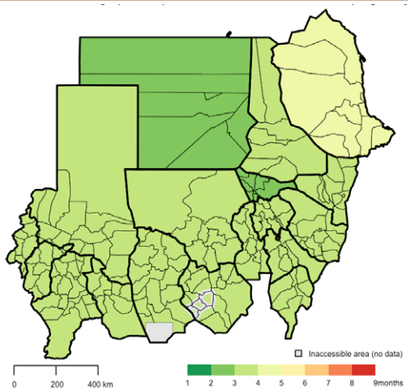


FIGURE 259:
ANC: Number of ANC visits during most recent pregnancy (raster)

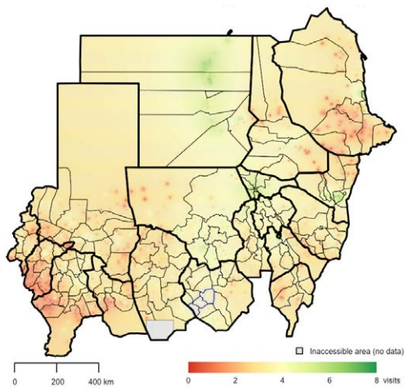


FIGURE 260:
ANC: Number of ANC visits during most recent pregnancy

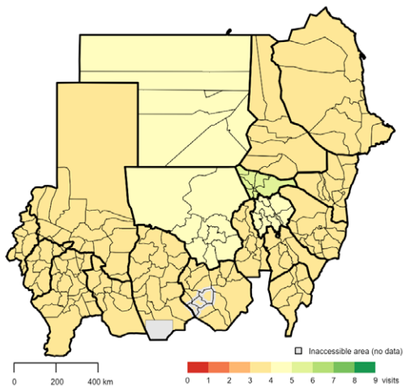


FIGURE 261:
ANC: Did not attend ANC during most recent pregnancy (raster)

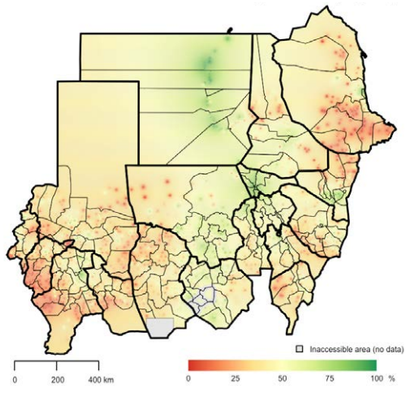


FIGURE 262:
ANC: Did not attend ANC during most recent pregnancy

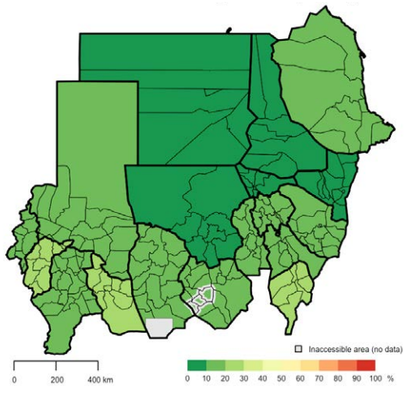


FIGURE 263:
ANC: Attended four or more ANC visits during most recent pregnancy (Raster)

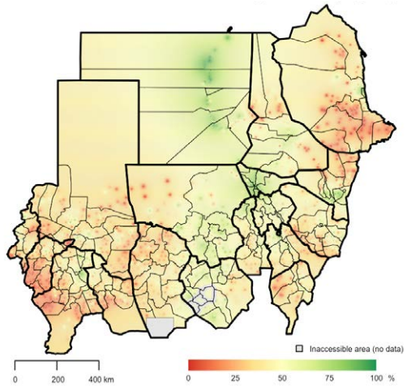
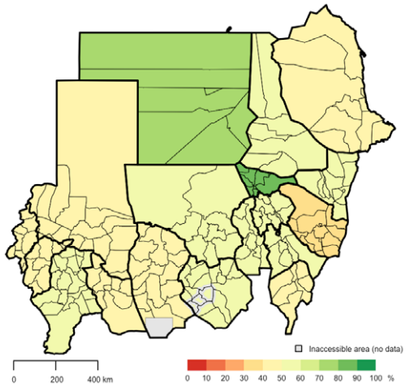


FIGURE 264:
ANC: Attended four or more ANC visits during most recent pregnancy



3.12 Antenatal iron and folic acid (IFA) supplementation

During ANC visits in Sudan, expectant mothers are offered folic acid and iron together as iron folic acid (IFA). The Sudan S3M II results indicate that pregnant women in the country took IFA tablets for 2.4 (95 per cent CI 2.0-2.8) months on average, which is lower than the ideal period of nine months.

Antenatal IFA supplementation average results

Among the states, Khartoum state had the highest number of months of IFA consumption at 3.6 (95 per cent CI 3.1-4.0) months, while East Darfur had the lowest number of months of IFA consumption at 1.0 (95 per cent CI 0.8-1.2) months. The number of months of IFA consumption was evenly distributed across states *(see Figure 265).*

Across the localities, Port Sudan locality in Red Sea state had the highest number of months of IFA consumption at 5.06 (95 per cent CI 4.63-5.53) months, significantly higher than all other localities in the country. Bahr El Arab locality in East Darfur state had the lowest number of months of IFA consumption at 0.16 (95 per cent CI 0.06-0.29) months. The number of months of IFA consumption was evenly distributed across all localities in Sudan *(see Figure 265).*

Consumption of IFA tablets for any length of time during the most recent pregnancy was high at 71.5 per cent (95 per cent CI 63.2-79.7 per cent) for the whole of Sudan.

At the state level, Northern state had the highest rate of any IFA consumption at 88.2 per cent (95 per cent CI 82.7-93.6 percent), while Central Darfur had the lowest rate at 45.7 per cent (95 per cent CI 32.9-58.5 percent).

Among the localities, rural Khashm Elgirba locality in Kassala state had the highest rate of IFA consumption for any length of time at 96.44 per cent (95 per cent CI 90.06-100 percent). However, 15 localities including: eight in South Darfur; three in Central Darfur; and two each in West Darfur, East Darfur and Red Sea states had significantly lower consumption of any IFA tablets *(see Figure 266).* The lowest consumption level was found in Bahr El Arab locality in East Darfur state, with a rate of only 8.36 per cent (95 per cent CI 3.45-15.37 per cent) of pregnant women taking any IFA tablets.

Consumption of IFA tablets for at least three months of the pregnancy was at a much lower rate for the whole of Sudan at only 45.0 per cent (95 per cent CI 36.4-53.6 percent). At the state level, Khartoum

state had the highest rate of IFA consumption for at least three months at 72.4 per cent (95 per cent CI 64.0-80.6 percent), while East Darfur had the lowest three-month consumption rate at 11.8 per cent (95 per cent CI 6.8-16.7 percent).

Across the localities, Halfa locality in Northern state had the highest consumption of IFA tablets for at least three months at 87.9 per cent (95 per cent CI 84.2-91.6 percent). El Sunta locality in South Darfur state had the lowest consumption of IFA tablets for at least three months at 0 per cent (95 per cent CI 0-0 percent).

FIGURE 265: Box plot of state and locality results of number of months of IFA tablets consumed

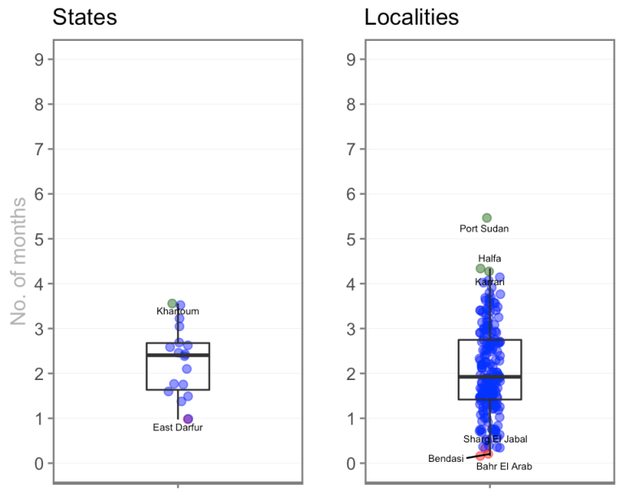


FIGURE 266: Box plot of state and locality results of any IFA consumption and at least 3 months of IFA consumption

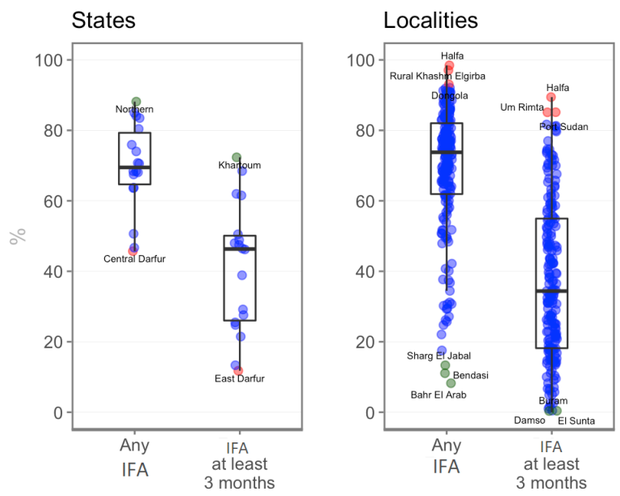


TABLE 75: Antenatal IFA supplementation by state and national

State	Number of months IFA Tablets consumed (months)			Consumed any IFA Tablets %			Consumed IFA Tablets for at least 3 months %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	2.46	2.04	2.87	74.03	65.46	82.59	46.43	36.66	56.20
Al-Gazeera	2.39	1.99	2.78	70.77	63.21	78.33	46.20	37.36	55.04
Blue Nile	2.09	1.64	2.55	63.63	51.28	75.97	38.87	29.21	48.54
Central Darfur	1.38	0.91	1.84	45.69	32.92	58.46	24.77	14.06	35.48
East Darfur	0.97	0.75	1.20	50.64	41.83	59.46	11.77	6.80	16.74
Kassala	3.05	2.65	3.45	84.96	78.56	91.35	61.52	52.63	70.40
Khartoum	3.56	3.14	3.98	84.08	78.16	90.00	72.36	64.10	80.63
North Darfur	1.77	1.41	2.12	68.40	57.79	79.01	29.17	19.11	39.24
North Kordofan	2.69	2.30	3.09	80.42	74.73	86.12	47.49	39.74	55.24
Northern	3.52	3.11	3.93	88.15	82.71	93.59	68.45	58.55	78.35
Red Sea	2.58	2.15	3.01	68.06	59.28	76.83	48.00	38.04	57.97
River Nile	2.42	2.05	2.80	68.36	59.66	77.07	48.89	39.90	57.88
Sennar	2.63	2.25	3.02	75.93	68.23	83.62	50.50	41.12	59.88
South Darfur	0.99	0.68	1.31	46.70	36.32	57.08	13.32	6.74	19.90
South Kordofan	1.75	1.38	2.11	70.56	61.69	79.43	27.57	18.63	36.51
West Darfur	1.60	1.23	1.96	63.74	54.66	72.82	25.50	15.85	35.16
West Kordofan	1.49	1.25	1.74	67.46	59.41	75.50	21.46	14.81	28.11
White Nile	3.22	2.85	3.59	83.48	76.89	90.07	61.96	53.67	70.24
Sudan	2.40	2.02	2.79	71.46	63.21	79.71	44.98	36.35	53.62

TABLE 76: Antenatal IFA supplementation by locality and by state

Location	Number of months IFA Tablets consumed (months)			Consumed any IFA Tablets %			Consumed IFA Tablets for at least 3 months %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	3.84	3.42	4.20	93.69	89.26	96.79	81.09	69.74	89.37
El Golid	3.59	3.28	3.85	91.32	86.92	95.00	71.78	64.98	78.26
Merwoe	3.02	2.41	3.75	79.39	70.70	87.94	53.51	42.68	67.87
El Daba	3.41	3.05	3.71	88.66	82.86	93.19	59.49	47.66	70.38
Halfa	4.50	4.29	4.71	95.54	92.45	97.90	87.88	84.19	91.61
Delgo	3.62	3.33	3.90	89.59	83.41	93.81	73.76	66.99	80.83
El Burgaig	3.63	3.36	3.91	88.75	83.70	93.03	74.19	67.69	79.67
Northern State	3.52	3.11	3.93	88.15	82.71	93.59	68.45	58.55	78.35

TABLE 76: Antenatal IFA supplementation by locality and by state

Location	Number of months IFA Tablets consumed (months)			Consumed any IFA Tablets %			Consumed IFA Tablets for at least 3 months %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Matama	2.79	2.37	3.18	75.92	67.54	84.36	54.98	46.37	64.15
Shendi	2.26	1.80	2.75	67.49	57.27	77.99	44.78	36.34	55.92
Abu Hamad	1.43	1.12	1.74	46.74	37.25	55.37	31.63	21.54	41.08
Barbar	2.31	1.95	2.69	67.17	58.94	74.76	51.03	40.29	61.03
El Damar	2.26	2.02	2.49	69.06	61.77	74.89	43.75	37.61	49.18
Atbara	3.86	3.32	4.31	83.90	74.08	90.37	78.10	68.41	85.88
El Buhaira	1.69	1.48	1.95	61.84	55.05	68.90	30.76	25.49	36.97
River Nile State	2.68	2.51	2.87	71.98	68.72	75.10	53.27	49.50	57.10
Khartoum	3.04	2.75	3.37	77.69	71.65	83.51	68.54	60.66	76.41
Bahri	3.40	2.93	3.90	84.05	76.14	90.43	64.47	53.46	73.87
Um Durman	4.03	3.74	4.31	89.46	85.32	93.47	81.53	76.61	85.12
Um Bada	3.66	3.30	4.02	82.06	73.61	88.78	77.25	68.21	84.12
Jebel Awlia	2.85	2.46	3.32	79.95	73.54	86.72	58.41	48.99	68.35
Sharg Elneel	3.81	3.53	4.10	87.67	83.02	91.12	76.52	69.99	81.37
Karrari	4.35	3.80	4.83	89.52	84.25	93.66	82.30	74.67	90.43
Khartoum State	3.56	3.14	3.98	84.08	78.16	90.00	72.36	64.10	80.63
Greater Medani	2.78	2.35	3.26	71.58	61.07	79.55	53.01	43.42	65.13
Ganub Elgazira	2.88	2.46	3.34	73.94	67.37	81.47	58.25	49.00	67.20
El Hassahisa	2.74	2.38	3.12	77.52	70.68	83.86	54.63	46.86	62.84
El Kamlin	2.42	2.14	2.70	74.33	67.46	79.76	48.45	40.48	55.67
Sharg El Gezira	1.98	1.67	2.38	58.84	51.27	66.17	38.16	29.75	45.76
Um Elqura	2.03	1.66	2.33	60.69	51.31	67.93	39.27	30.01	46.74
El Manaqil	1.88	1.53	2.23	65.88	56.81	74.56	34.59	25.77	43.80
El Qurashi	2.53	2.13	2.89	81.05	73.02	87.25	47.03	35.87	56.07
Al-Gazeera State	2.39	1.99	2.78	70.77	63.21	78.33	46.20	37.36	55.04
Sennar	3.57	3.22	3.85	83.26	78.67	87.25	67.18	59.34	72.98
Sharg Sennar	1.56	1.18	2.11	53.22	42.65	64.98	31.56	22.95	41.21
Sinja	3.31	3.06	3.52	85.33	81.40	88.73	67.77	61.46	73.09
Abu Hujar	2.04	1.60	2.61	73.40	64.42	82.43	37.44	25.72	49.57
El Dali	2.32	1.90	2.79	74.76	67.73	82.49	44.34	34.83	55.33
Es Suki	3.02	2.51	3.49	84.71	78.31	90.50	57.82	45.44	71.54
Ed Dinder	1.98	1.73	2.20	76.66	67.73	85.08	37.42	28.35	45.18
Sennar State	2.63	2.25	3.02	75.93	68.23	83.62	50.50	41.12	59.88
Ed Damazine	3.24	2.68	3.74	74.90	68.73	81.19	58.30	49.93	66.67
El Tadamon	1.30	1.14	1.46	65.85	53.81	77.61	20.10	15.31	25.07
El Roseiris	2.88	2.45	3.33	72.38	62.75	80.56	54.42	43.99	64.63
Baw	1.36	0.93	1.78	55.49	37.79	71.86	24.78	16.85	33.04

TABLE 76: Antenatal IFA supplementation by locality and by state

Location	Number of months IFA Tablets consumed (months)			Consumed any IFA Tablets %			Consumed IFA Tablets for at least 3 months %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Geisan	1.70	1.18	2.07	66.40	46.87	83.16	35.11	25.25	44.45
El Kurmuk	1.13	0.65	1.56	48.56	28.81	66.94	20.16	11.19	29.38
Wad El Mahi	1.10	0.81	1.45	44.75	34.19	56.40	22.09	14.84	31.12
Blue Nile State	2.09	1.64	2.55	63.63	51.28	75.97	38.87	29.21	48.54
Kosti	3.43	2.92	3.83	84.01	76.61	90.41	64.88	55.77	74.05
Guli	3.06	2.70	3.41	74.42	68.54	78.87	61.44	52.45	69.59
Tendalti	3.14	2.75	3.47	86.23	81.00	90.36	58.93	52.85	65.02
Es Salam	2.24	1.97	2.53	80.81	74.49	86.47	44.02	35.36	53.41
Rabak	3.44	3.13	3.72	84.48	80.06	88.54	67.49	60.70	74.58
El Jabalain	2.96	2.67	3.28	85.66	81.26	89.56	62.79	54.56	70.41
El Diwaim	2.74	2.33	3.17	73.40	63.18	83.18	42.55	32.79	52.61
Um Rimta	4.06	3.81	4.28	90.66	86.36	94.01	85.05	79.79	89.15
El Gitaina	3.57	3.16	3.91	91.74	87.35	95.56	73.84	63.81	80.00
White Nile State	3.22	2.85	3.59	83.48	76.89	90.07	61.96	53.67	70.24
Port Sudan	5.06	4.63	5.53	87.76	82.55	91.93	84.28	77.44	89.02
Swakin	2.58	2.09	3.14	64.77	54.21	75.76	48.68	39.69	56.77
El Gonob Welawlaib	2.70	2.34	2.99	85.45	77.37	92.40	61.28	48.47	72.05
Sinkat	1.47	1.13	1.89	69.81	56.60	80.10	15.02	7.78	22.23
Haya	0.56	0.30	0.81	22.83	14.75	32.03	9.09	3.34	15.50
Dordieb	2.00	1.37	2.52	72.66	52.32	90.12	41.70	28.47	55.98
Tokar	3.13	2.83	3.40	90.84	85.71	94.48	65.71	56.27	74.30
Agig	2.61	2.09	3.13	85.78	76.18	92.66	52.37	37.24	66.49
Gabaot Elma-aadin	2.80	2.45	3.15	85.76	80.06	90.53	61.36	51.63	70.90
Halaeeb (accessible parts)	3.32	2.60	3.97	82.83	67.16	92.23	79.66	58.45	92.61
Red Sea State	2.58	2.15	3.01	68.06	59.28	76.83	48.00	38.04	57.97
Kassala Town	3.70	3.29	4.16	90.92	86.90	94.32	74.22	65.32	82.54
Refi Kassla	3.23	2.94	3.49	91.71	87.72	94.91	70.14	63.25	76.60
Rural Western Kassala	3.56	3.23	4.01	91.21	88.25	94.08	75.18	69.27	80.01
New Halfa	3.84	3.21	4.55	85.40	78.57	90.97	67.08	59.47	75.08
Refi Nahr Atbara	2.21	1.81	2.68	72.06	64.28	78.80	42.12	31.29	54.23
Rural Khashm Elgirba	3.36	3.10	3.58	96.44	90.06	100.00	82.14	74.46	88.74
Rural Wad Elhilaiw	2.47	2.21	2.75	81.76	75.41	87.25	56.32	47.18	64.84
Rural Aroma	2.40	2.02	2.84	84.72	76.87	91.71	39.45	29.89	48.88
Refi North Delta	2.38	2.01	2.80	75.86	66.75	83.20	53.58	45.01	64.16
Refi Hamashkureib	3.34	2.97	3.66	90.14	84.68	94.32	69.49	59.66	79.13

TABLE 76: Antenatal IFA supplementation by locality and by state

Location	Number of months IFA Tablets consumed (months)			Consumed any IFA Tablets %			Consumed IFA Tablets for at least 3 months %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Telkok	2.15	1.77	2.44	74.68	64.41	83.47	40.96	32.23	49.38
Kassala State	3.05	2.65	3.45	84.96	78.56	91.35	61.52	52.63	70.40
Gedaref Town	3.57	3.13	4.00	91.12	85.64	94.94	66.67	57.91	75.17
Middle Geddaref	3.14	2.67	3.67	86.63	80.72	92.09	63.33	44.60	77.43
Elbutana	2.74	2.08	3.36	80.56	72.77	87.01	52.94	35.87	69.03
El Fashaga	2.64	2.05	3.29	71.16	58.74	80.60	57.20	43.47	68.66
El Rahad	1.24	0.91	1.65	46.84	33.72	60.15	23.60	16.17	30.96
Gala-a El Nahal	2.29	1.68	2.89	79.11	65.38	88.24	37.76	25.69	49.30
El Fao	1.44	1.25	1.62	66.43	59.06	73.43	16.93	13.25	21.64
El Qureisha	2.87	2.42	3.32	74.04	64.50	82.64	64.74	52.76	75.63
El Mafaza	2.06	1.80	2.29	75.80	68.16	83.05	39.84	28.69	47.85
Basunda	2.55	2.14	2.98	74.63	66.59	81.09	41.36	32.68	49.14
Western Galabat	2.69	2.30	3.06	77.50	67.55	84.25	60.63	49.71	71.06
Eastern Galabat	2.54	2.21	2.91	70.30	63.15	77.62	47.49	40.43	54.87
Al-Gadarif State	2.46	2.04	2.87	74.03	65.46	82.59	46.43	36.66	56.20
Sheikan	2.88	2.58	3.23	80.65	76.32	84.95	51.39	45.57	57.47
Um Rawaba	2.54	2.18	2.87	82.07	76.14	87.65	44.15	36.23	51.94
Um Dam Haj Ahmed	3.21	2.66	3.79	87.35	80.82	92.79	58.11	47.90	68.60
El Rahad	3.08	2.53	3.50	81.00	74.73	86.96	52.28	41.07	61.17
Bara	2.95	2.60	3.27	86.81	82.08	91.04	55.67	48.35	63.09
Gharb Bara	2.81	2.41	3.19	85.11	79.49	90.00	52.89	42.47	61.28
Soudari	1.56	1.21	2.00	62.60	54.75	71.52	21.94	15.11	30.23
Gebrat El Sheikh	2.87	2.46	3.26	84.06	77.20	90.11	50.19	42.43	58.51
North Kordofan State	2.69	2.30	3.09	80.42	74.73	86.12	47.49	39.74	55.24
Kadugli	2.59	2.27	2.88	77.59	71.95	82.75	49.11	42.93	54.62
Reif Shargi	1.59	1.32	1.85	59.71	51.01	66.95	26.14	19.59	32.38
Dilling	1.90	1.26	2.42	64.87	49.62	76.20	33.82	20.78	47.85
El Quoz	2.06	1.78	2.36	70.76	63.20	78.27	34.23	26.15	41.60
Habila	1.63	1.21	2.08	69.37	61.28	76.51	22.57	13.61	32.64
Abassiya	1.56	1.26	1.95	69.38	59.82	78.33	21.63	14.41	30.22
El Rashad	1.75	1.33	2.23	65.58	54.67	77.10	32.04	21.98	41.25
Abu Jubaiha	1.39	1.20	1.59	70.79	64.77	75.82	17.96	12.64	24.42
El Tadamon	1.53	1.25	1.82	68.65	58.76	76.11	21.36	16.31	28.22
Talodi	1.41	1.23	1.60	76.92	66.42	83.96	16.90	8.51	26.24
Ghadeer	1.81	1.40	2.28	83.00	74.43	91.14	27.88	16.19	40.55
El Leri	1.25	1.02	1.54	66.67	59.75	72.82	15.57	8.25	23.70
Abu Karshola	1.90	1.55	2.25	74.00	67.35	79.26	30.89	22.91	39.07

TABLE 76: Antenatal IFA supplementation by locality and by state

Location	Number of months IFA Tablets consumed (months)			Consumed any IFA Tablets %			Consumed IFA Tablets for at least 3 months %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Delami	1.90	1.26	2.42	72.44	50.82	87.65	33.46	16.93	51.23
South Kordofan State	1.75	1.38	2.11	70.56	61.69	79.43	27.57	18.63	36.51
Abu Zabad	2.21	1.90	2.55	82.08	75.58	88.34	35.28	27.70	42.27
ElKhiwai	1.84	1.62	2.04	75.47	67.70	80.76	33.96	28.87	39.30
Ghubaish	1.26	1.07	1.46	64.55	58.12	71.64	17.14	11.96	22.85
El Nuhud	1.11	0.96	1.26	57.22	50.13	63.80	11.62	8.75	15.18
El Idia	1.47	1.27	1.68	67.93	60.00	76.10	20.94	13.70	27.91
Wad Benda	1.18	0.95	1.38	57.53	47.84	65.79	17.96	13.14	22.37
Lagawa	1.29	1.01	1.52	66.11	57.37	73.10	17.86	11.81	24.56
Elsunut	1.87	1.48	2.25	74.58	65.21	82.68	25.92	18.12	33.50
Keilik	2.38	2.17	2.55	89.18	82.00	93.41	49.16	40.20	56.73
Es Salam	1.82	1.62	2.03	75.03	68.91	80.09	24.19	19.21	30.94
Babanusa	1.45	1.30	1.60	76.25	69.09	83.41	15.72	11.62	19.49
Abyei	1.58	1.41	1.77	71.39	63.24	78.09	27.18	21.26	32.51
El Dibab	1.75	1.45	2.06	73.44	62.16	80.87	26.94	19.88	35.75
El Meiram	1.01	0.75	1.46	54.97	44.52	66.52	9.38	1.80	26.13
West Kordofan State	1.49	1.25	1.74	67.46	59.41	75.50	21.46	14.81	28.11
El Fasher	2.22	1.94	2.50	75.62	71.21	79.43	39.67	32.99	45.26
Tawila	2.40	1.82	3.00	69.71	56.74	82.11	48.60	37.31	60.19
Melit	1.62	1.37	1.86	72.95	64.03	80.17	23.54	17.63	30.28
Um Kadada	1.38	1.18	1.61	77.75	69.67	84.87	15.69	11.14	22.52
Kebkabiya	2.30	1.95	2.64	66.75	60.00	72.62	43.86	33.66	52.42
Kutum	1.90	1.54	2.32	53.58	46.12	60.28	33.46	26.73	41.04
El Mahalha	1.50	1.11	1.87	68.68	53.66	80.27	17.46	10.08	26.12
Saraf Omra	1.20	0.75	1.75	53.81	42.48	64.54	17.81	7.72	28.68
El Serief	1.01	0.79	1.22	48.81	39.06	59.26	16.76	9.72	23.19
Dar Elsalam	1.72	1.55	1.94	74.64	69.11	80.09	30.09	24.04	37.01
Kelemando	1.55	1.31	1.78	69.74	63.17	75.13	24.49	18.16	30.58
El Tawisha	1.36	1.17	1.62	64.01	59.71	68.95	18.61	14.06	23.01
Um Baru	1.66	1.30	1.97	81.96	69.06	90.34	23.27	13.91	31.30
El Lait	1.42	1.14	1.69	63.05	55.21	70.41	19.30	13.94	25.18
ELkuma	2.99	1.89	3.60	83.97	70.02	92.50	57.14	35.25	70.79
El Tina	1.22	0.67	1.78	77.78	55.00	100.00	11.11	0.00	33.33
Kernoi	1.93	1.72	2.13	71.00	65.87	76.24	36.69	29.96	42.60
North Darfur State	1.77	1.41	2.12	68.40	57.79	79.01	29.17	19.11	39.24
Nyala South	1.98	1.62	2.41	67.72	59.02	74.34	40.76	31.19	51.07

TABLE 76: Antenatal IFA supplementation by locality and by state

Location	Number of months IFA Tablets consumed (months)			Consumed any IFA Tablets %			Consumed IFA Tablets for at least 3 months %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nyala North	1.22	0.67	1.99	54.93	33.91	73.95	18.25	5.05	32.62
Es Salam	1.14	0.96	1.33	51.29	44.63	57.06	15.50	11.94	19.29
El Wihda	2.05	1.70	2.47	65.33	55.11	74.77	37.50	26.94	46.21
Mershing	1.49	1.20	1.82	82.50	75.24	88.22	14.80	7.30	22.93
Beliel	1.63	1.47	1.80	77.34	72.65	81.76	21.67	15.81	26.93
Nitega	0.75	0.66	0.85	68.86	61.26	74.94	1.49	0.25	3.20
Sharg El Jabal (accessible parts)	0.33	0.00	0.87	13.33	0.00	33.33	6.67	0.00	20.00
Kas	1.86	1.58	2.17	75.27	66.31	84.14	29.55	23.14	36.67
Shattaya	1.60	1.16	2.06	64.32	48.79	76.33	28.88	17.53	40.80
Buram	0.34	0.26	0.43	24.86	18.46	31.60	0.39	0.00	1.53
Gereida	1.22	1.02	1.39	63.96	53.63	70.00	13.73	10.07	18.06
El Sunta	0.42	0.31	0.52	40.34	31.73	50.31	0.00	0.00	0.00
El Radoum	0.65	0.41	0.92	33.64	23.14	45.62	6.59	3.33	10.52
Tulus	0.69	0.46	1.06	43.09	30.55	59.22	2.67	0.00	8.81
Damso	0.41	0.29	0.53	31.29	21.52	40.42	0.68	0.00	2.42
Ed Elfursan	0.49	0.34	0.67	25.78	18.78	33.15	6.50	3.50	10.36
Kubum	0.58	0.47	0.70	31.61	25.29	37.53	4.88	2.98	7.30
Kateila	0.58	0.36	0.86	30.12	22.08	37.85	6.61	2.67	11.06
Rehaid Elbirdi	0.74	0.51	0.95	28.92	20.87	35.35	13.17	8.08	18.28
Um Dafoug	0.33	0.12	0.73	17.12	7.99	29.82	6.00	1.01	11.64
South Darfur State	0.99	0.68	1.31	46.70	36.32	57.08	13.32	6.74	19.90
Abu Jabra	0.76	0.57	0.98	45.74	34.86	57.01	8.58	4.68	12.72
Abu Karinka	1.20	1.03	1.37	65.06	57.26	73.15	12.88	8.22	19.89
Bahr El Arab	0.16	0.06	0.29	8.36	3.45	15.37	2.52	0.63	5.06
Adila	1.17	0.79	1.52	52.07	39.58	63.67	16.87	9.45	24.65
Ed Dain	2.09	1.74	2.43	76.27	69.86	80.83	33.40	26.86	41.39
Assalaya	0.74	0.60	0.89	50.08	42.03	58.35	4.83	2.42	8.10
El Firdous	0.60	0.48	0.79	52.36	43.24	64.44	1.13	0.00	3.42
Shia-ria	1.26	1.10	1.41	76.41	70.91	80.83	12.41	7.58	17.00
Yassin	1.29	1.07	1.54	58.75	48.60	68.29	19.97	13.94	26.33
East Darfur State	0.97	0.75	1.20	50.64	41.83	59.46	11.77	6.80	16.74
El Geneina	2.25	1.87	2.63	77.19	69.80	83.76	42.05	32.79	51.99
Habila	0.69	0.47	0.93	27.27	20.31	36.39	13.54	7.49	20.72
Kulbus	1.35	1.02	1.68	62.50	53.25	71.07	14.47	7.45	22.80
Beida	1.76	1.50	2.02	78.56	66.71	87.98	16.05	9.92	24.07
Foro Baranga	0.67	0.50	0.85	27.05	20.22	33.46	13.08	8.85	18.31
Kereneik	1.56	1.38	1.70	75.42	71.79	79.32	21.18	16.41	26.58

TABLE 76: Antenatal IFA supplementation by locality and by state

Location	Number of months IFA Tablets consumed (months)			Consumed any IFA Tablets %			Consumed IFA Tablets for at least 3 months %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sirba	1.51	1.18	1.90	67.88	57.08	77.11	23.50	13.69	36.19
Jebel Moon	1.49	0.92	2.17	54.94	38.27	70.59	24.34	12.69	38.43
West Darfur State	1.60	1.23	1.96	63.74	54.66	72.82	25.50	15.85	35.16
Zalingi	2.89	2.54	3.23	76.55	69.83	83.03	54.61	46.92	61.07
Wadi Salih	0.94	0.63	1.22	39.60	28.26	51.46	20.67	13.00	29.35
Mukjar	0.70	0.26	1.36	27.02	7.74	48.72	13.56	0.44	29.64
Central Jebel Mara	1.70	1.24	2.28	68.42	55.47	79.72	27.82	15.49	40.15
North Jebel Mara	1.65	1.10	2.34	36.36	25.82	49.67	28.77	15.57	43.88
Bendasi	0.21	0.10	0.34	11.96	5.70	18.35	0.99	0.00	3.58
Nertiti	2.49	1.95	3.05	76.37	66.98	84.93	43.44	32.36	54.28
Azum	1.82	1.36	2.27	60.25	44.87	74.44	31.61	22.56	38.64
Um Dukhun	0.71	0.49	0.99	29.25	19.95	38.81	8.52	4.74	13.10
Central Darfur State	1.38	0.91	1.84	45.69	32.92	58.46	24.77	14.06	35.48

Spatial distribution of antenatal IFA supplementation

Generally, the distribution of months of IFA consumption was fairly evenly spread throughout the country, with some pockets of variability *(see Figure 267*). Most of the Darfur states, South Kordofan state and West Kordofan state had the shortest duration of IFA tablet consumption. There were pockets of high IFA tablet consumption in the following places: central areas of Northern and Khartoum states; northern areas of White Nile state; southern areas of North Kordofan; central areas of Al- Gadarif and Kassala states; and the western coast of Red Sea state. This spatial pattern was similar to the spatial pattern of the number of ANC visits and the rate of four or more ANC visits.

There was an even spatial spread of moderate-to-high consumption of any IFA tablets during the most recent pregnancy. Pockets of low consumption of any IFA tablets are found in the southern areas of Central Darfur, South Darfur, East Darfur and West Darfur *(see Figure 269).*

All of the Darfur states - West Kordofan, South Kordofan and parts of North Kordofan - had the lowest proportion of women who consumed IFA tablets for three or more months during most recent pregnancy, while the northern and eastern parts of Sudan had the highest proportion *(see Figure 271).* This followed the same spatial pattern as the number of ANC visits and rate of four or more ANC visits.

FIGURE 267:
ANC: Number of months IFA tablets consumed during most recent pregnancy (Raster)

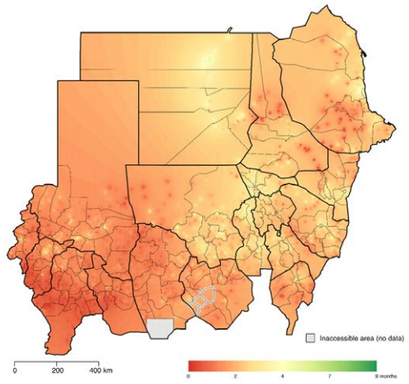


FIGURE 268:
ANC: Number of months IFA tablets consumed during most recent pregnancy

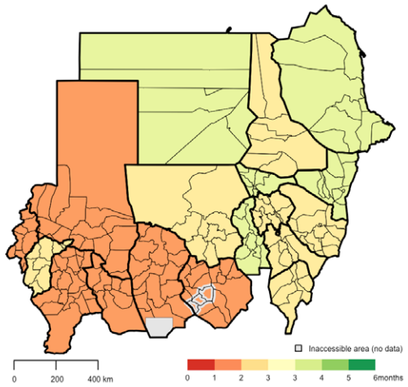


FIGURE 269:
ANC: Consumed any IFA tablets during most recent pregnancy (raster)

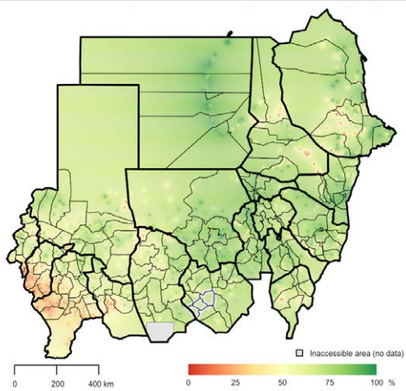


FIGURE 270:
ANC: Consumed any IFA tablets during most recent pregnancy

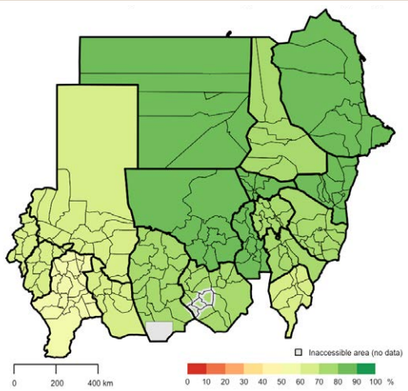


FIGURE 271:
ANC: Consumed IFA tablets for at least 3 months during most recent pregnancy (Raster)

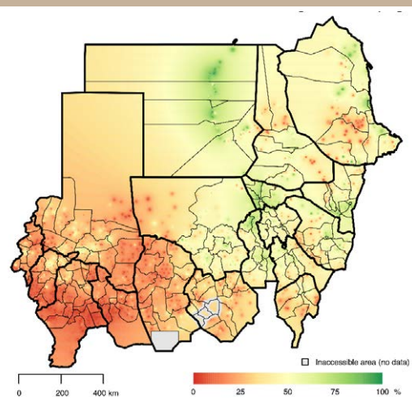
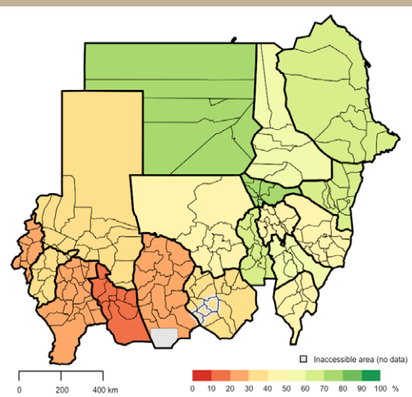


FIGURE 272:
ANC: Consumed IFA tablets for at least 3 months during most recent pregnancy



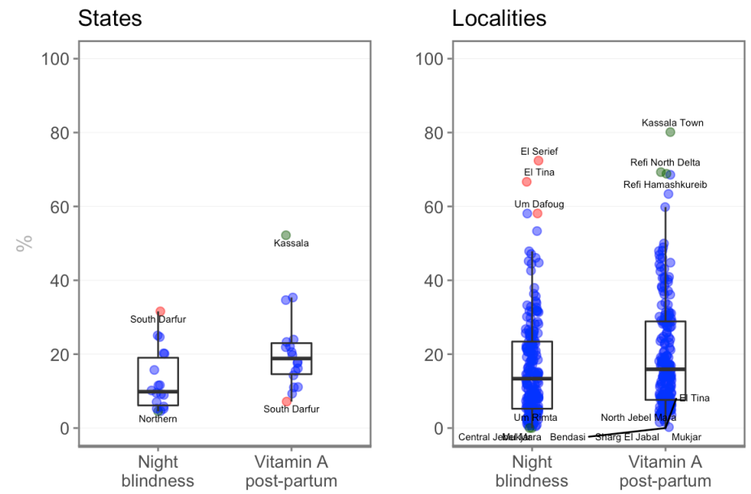
3.13 Postpartum care coverage

Postpartum vitamin A supplementation average results

Vitamin A supplementation is only recommended for postpartum mothers in areas where vitamin A deficiency is a severe public health problem, to prevent night blindness.[46] [47] Results of the S3M II survey showed that postpartum vitamin A supplementation was extremely low at 22.4 per cent (95 per cent CI 15.1-29.7 per cent) coverage for the whole of Sudan.

At the state level, Kassala state, Khartoum state and Red Sea state had the highest rate of postpartum vitamin A supplementation at 52.2 per cent (95 per cent CI 43-61.4 percent), 35.6 per cent (95 per cent CI 26.9-43.8 percent), and 34.6 per cent (95 per cent CI 24.4.4-44.8 per cent) respectively. These three states had significantly higher rates of postpartum vitamin A supplementation than all other states in Sudan. South Darfur state had the lowest postpartum vitamin A supplementation at 7.2 per cent (95 per cent CI 2.9-11.4 percent). The distribution of state-level postpartum vitamin A supplementation was skewed to the left *(see Figure 273)*. Across the localities, five had significantly higher rates of postpartum vitamin A supplementation, four of which were in Kassala state, with rates as high as 80.48 per cent.

FIGURE 273: Box plot of state and locality results of postpartum vitamin A consumption and night blindness prevalence



Maternal night blindness average results

Lack of adequate vitamin A is known to significantly increase the rate of night blindness during and after pregnancy, so a night blindness indicator is a proxy for the effects of vitamin A deficiency. Results of the S3M II showed that self-reported night blindness among postpartum women was significant at 13.0 per cent (95 per cent CI 7.2-18.8 per cent).

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[46] World Health Organization, 'WHO | Vitamin A Supplementation: Full set of recommendations', Geneva 2011, <www.who.int/elena/titles/full_recommendations/vitamina_supp/en/>, accessed 15 January 2020.

[47] Determination of vitamin A deficiency as a public health problem involves estimating the prevalence of deficiency in a population by using specific biochemical and clinical indicators of vitamin A status. A severe public health problem exists if at least one of two conditions is met: if ≥20 per cent of pregnant women have a serum retinol level <0.70 µmol/L ; or, if ≥5 per cent of women in a population have a history of night blindness during their most recent pregnancy, which must have occurred within the previous 3–5 years and resulted in a live birth.

Among the states, South Darfur state had reported the highest prevalence of postpartum night-blindness at 31.6 per cent (95 per cent CI 22.6-40.6 per cent), while Northern state had the lowest prevalence at 4.6 per cent (95 per cent CI 1.8-7.3 per cent).

At the locality level, five localities had higher rates of night blindness than all others; three of those were in South Darfur state and the other two were in North Darfur state, with the highest prevalence in El Serief locality in North Darfur at 76.16 per cent (95 per cent CI 70.35-81.93 per cent).

TABLE 77: Vitamin A supplementation and postpartum care by state and national

State	Received Vitamin A Tablets Postpartum %			Experienced Night Blindness %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	23.30	13.12	33.48	11.62	4.74	18.51
Al-Gazeera	17.56	11.24	23.89	8.98	4.16	13.81
Blue Nile	19.75	10.83	28.66	9.17	3.81	14.53
Central Darfur	14.29	7.92	20.66	7.06	2.85	11.28
East Darfur	16.15	9.73	22.57	20.24	13.70	26.77
Kassala	52.21	43.00	61.42	4.58	1.53	7.63
Khartoum	35.35	26.93	43.77	5.22	2.20	8.24
North Darfur	21.89	14.39	29.40	25.07	15.61	34.54
North Kordofan	20.56	15.03	26.09	15.72	11.22	20.23
Northern	23.94	15.42	32.46	4.55	1.82	7.28
Red Sea	34.64	24.44	44.84	11.53	4.57	18.50
River Nile	9.30	4.93	13.67	5.27	2.27	8.28
Sennar	22.06	14.99	29.14	9.52	4.81	14.23
South Darfur	7.15	2.87	11.44	31.58	22.56	40.60
South Kordofan	11.11	5.12	17.11	20.13	12.49	27.78
West Darfur	15.47	8.53	22.40	5.82	2.35	9.28
West Kordofan	11.01	6.43	15.60	24.64	17.24	32.04
White Nile	17.92	12.34	23.49	10.17	5.92	14.41
Sudan	22.39	15.14	29.65	13.04	7.24	18.84

TABLE 78: Vitamin A supplementation by locality and by state

Location	Received Vitamin A Tablets Postpartum %			Experienced Night Blindness %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	17.59	8.11	28.01	3.20	1.45	5.71
El Golid	37.53	28.93	46.01	0.80	0.00	2.91

TABLE 78: Vitamin A supplementation by locality and by state

Location	Received Vitamin A Tablets Postpartum %			Experienced Night Blindness %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Merwoe	9.29	4.96	13.38	10.57	6.96	15.02
El Daba	32.01	24.53	40.05	3.02	0.93	5.17
Halfa	11.50	7.32	16.27	2.26	0.33	5.50
Delgo	17.00	7.67	27.42	6.07	3.24	9.42
El Burgaig	41.82	33.33	50.86	2.41	0.63	4.92
Northern State	23.94	15.42	32.46	4.55	1.82	7.28
El Matama	9.70	5.41	14.60	3.79	1.05	7.58
Shendi	8.70	3.45	14.56	9.39	5.77	15.01
Abu Hamad	6.91	3.61	11.04	4.37	2.38	6.81
Barbar	6.47	3.80	11.75	2.51	1.05	4.55
El Damar	12.61	9.11	16.25	5.12	3.34	7.11
Atbara	10.55	5.73	15.87	3.81	1.96	6.25
El Buhaira	4.90	2.75	7.69	1.28	0.26	2.97
River Nile State	9.30	4.93	13.67	5.27	2.27	8.28
Khartoum	44.98	38.18	51.49	4.41	2.06	8.96
Bahri	40.11	33.70	47.37	13.89	8.28	18.81
Um Durman	46.70	40.14	54.05	5.85	3.47	8.20
Um Bada	29.01	19.92	38.52	2.68	0.96	5.10
Jebel Awlia	23.49	16.18	30.98	4.73	1.66	8.63
Sharg Elneel	34.94	28.36	41.61	4.28	2.26	6.56
Karrari	39.54	33.69	46.61	2.99	0.78	6.55
Khartoum State	35.35	26.93	43.77	5.22	2.20	8.24
Greater Medani	18.76	12.94	26.29	5.46	2.52	8.96
Ganub Elgazira	21.66	15.12	28.06	6.73	3.46	10.17
El Hassahisa	15.01	9.56	20.40	13.38	7.88	18.64
El Kamlin	44.76	33.67	55.96	8.28	4.36	14.32
Sharg El Gezira	13.89	9.52	18.24	8.15	3.87	13.74
Um Elqura	11.75	8.02	16.17	10.25	6.60	14.00
El Manaqil	14.23	9.48	20.08	6.37	3.15	9.92
El Qurashi	4.47	1.36	8.32	15.08	8.03	24.63
Al-Gazeera State	17.56	11.24	23.89	8.98	4.16	13.81
Sennar	29.55	24.56	35.40	5.94	3.46	9.03
Sharg Sennar	6.77	3.46	10.37	5.14	0.88	11.76
Sinja	28.65	23.36	33.57	8.95	6.20	12.22
Abu Hujar	24.74	12.13	40.61	10.45	6.10	14.88
El Dali	16.92	8.19	28.49	15.66	8.50	22.88
Es Suki	30.46	22.64	39.40	9.13	5.63	12.80
Ed Dinder	14.48	9.22	20.54	18.86	12.74	25.78

TABLE 78: Vitamin A supplementation by locality and by state

Location	Received Vitamin A Tablets Postpartum %			Experienced Night Blindness %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sennar State	22.06	14.99	29.14	9.52	4.81	14.23
Ed Damazine	7.34	4.17	12.27	4.58	1.90	7.73
El Tadamon	47.78	42.33	53.51	5.93	2.95	10.43
El Roseiris	17.50	9.84	28.81	1.64	0.70	3.02
Baw	36.31	21.95	49.13	14.41	8.30	21.07
Geisan	28.72	18.66	37.84	7.94	4.16	13.31
El Kurmuk	16.73	6.64	26.66	29.28	20.39	39.19
Wad El Mahi	5.59	2.76	10.24	10.59	4.90	18.69
Blue Nile State	19.75	10.83	28.66	9.17	3.81	14.53
Kosti	19.39	12.90	25.31	8.17	4.67	12.00
Guli	24.48	19.02	30.25	21.46	15.63	28.99
Tendalti	11.93	7.33	17.76	15.22	10.51	20.63
Es Salam	18.09	13.24	23.35	15.75	10.68	20.26
Rabak	43.93	37.08	52.06	10.65	7.57	14.19
El Jabalain	21.00	13.52	28.09	19.50	14.23	25.15
El Diwaim	5.64	1.18	11.27	7.33	4.71	10.16
Um Rimta	7.26	3.54	12.05	0.00	0.00	0.00
El Gitaina	6.50	3.59	9.71	3.02	0.80	6.24
White Nile State	17.92	12.34	23.49	10.17	5.92	14.41
Port Sudan	44.52	36.74	51.99	4.86	0.92	11.10
Swakin	21.99	13.01	32.24	3.07	0.00	7.80
El Gonob Welawlaib	42.96	26.20	59.24	10.64	5.25	17.27
Sinkat	29.49	19.87	40.84	25.49	19.35	31.29
Haya	3.30	0.75	7.25	2.88	0.00	8.21
Dordieb	44.20	25.30	59.10	17.94	11.59	24.95
Tokar	65.23	54.94	74.50	23.70	17.77	29.85
Agig	58.48	41.01	75.99	5.81	2.12	10.62
Gabaot Elma-aadin	48.47	39.45	57.21	7.63	3.86	11.07
Halaeeb (accessible parts)	45.00	29.66	58.56	25.00	7.80	40.99
Red Sea State	34.64	24.44	44.84	11.53	4.57	18.50
Kassala Town	80.48	72.53	87.83	4.56	1.98	7.68
Refi Kassla	69.02	61.96	75.96	4.66	2.56	7.28
Rural Western Kassala	25.13	18.52	33.63	7.39	2.57	13.74
New Halfa	40.80	32.30	49.46	5.53	3.21	8.12
Refi Nahr Atbara	18.28	12.59	25.71	10.92	6.30	16.19
Rural Khashm Elgirba	45.66	31.58	57.54	0.84	0.00	2.71
Rural Wad Elhilaiw	36.32	26.53	48.13	2.04	0.32	4.31

TABLE 78: Vitamin A supplementation by locality and by state

Location	Received Vitamin A Tablets Postpartum %			Experienced Night Blindness %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Aroma	28.01	16.80	38.58	1.89	0.22	4.80
Refi North Delta	69.23	59.70	78.09	2.05	0.23	6.39
Refi Hamashkureib	66.87	55.31	75.60	5.13	2.57	7.72
Rural Telkok	42.16	31.60	51.13	3.33	1.46	5.69
Kassala State	52.21	43.00	61.42	4.58	1.53	7.63
Gedaref Town	28.57	18.81	39.18	10.12	5.99	15.54
Middle Geddaref	25.33	14.57	35.22	10.62	5.47	17.07
Elbutana	21.15	13.44	30.25	7.93	4.15	13.19
El Fashaga	31.80	18.41	44.19	11.80	7.04	16.84
El Rahad	12.35	4.03	25.11	4.48	2.59	6.64
Gala-a El Nahal	23.65	10.51	43.97	16.09	5.94	29.99
El Fao	25.22	17.69	32.87	10.12	6.47	14.70
El Qureisha	38.67	25.49	50.99	15.68	9.69	23.51
El Mafaza	30.30	16.11	43.57	30.43	16.60	45.88
Basunda	16.70	11.44	22.52	8.22	4.22	12.83
Western Galabat	14.46	8.45	21.77	4.45	2.50	7.42
Eastern Galabat	13.77	9.48	18.62	10.38	6.06	15.23
Al-Gadarif State	23.30	13.12	33.48	11.62	4.74	18.51
Sheikan	27.35	22.02	31.98	12.61	9.61	16.32
Um Rawaba	21.72	16.81	26.62	15.89	11.94	20.23
Um Dam Haj Ahmed	27.54	20.96	36.31	15.67	10.16	20.70
El Rahad	16.05	12.06	22.42	19.41	13.69	24.88
Bara	19.85	13.63	27.10	13.68	9.54	18.62
Gharb Bara	10.22	6.28	14.44	14.31	10.03	18.35
Soudari	12.56	7.83	18.20	24.46	18.62	30.60
Gebrat El Sheikh	19.78	14.48	25.68	12.94	8.80	17.32
North Kordofan State	20.56	15.03	26.09	15.72	11.22	20.23
Kadugli	21.12	16.42	26.78	14.64	11.25	18.13
Reif Shargi	8.64	5.38	13.67	21.72	15.51	27.24
Dilling	11.84	5.34	19.35	21.38	9.71	34.77
El Quoz	14.50	8.40	21.57	23.05	16.82	28.74
Habila	11.89	8.16	16.32	14.81	8.51	21.78
Abassiya	6.13	3.14	10.17	12.67	7.69	18.96
El Rashad	6.81	3.14	11.14	13.18	7.40	20.90
Abu Jubaiha	10.71	5.53	16.42	22.68	16.47	29.43
El Tadamon	2.87	0.97	5.22	33.20	21.39	44.62
Talodi	12.23	0.00	29.26	19.72	13.29	26.24
Ghadeer	7.35	3.73	11.15	25.43	16.60	34.62

TABLE 78: Vitamin A supplementation by locality and by state

Location	Received Vitamin A Tablets Postpartum %			Experienced Night Blindness %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Leri	8.32	4.61	13.47	24.39	17.60	33.06
Abu Karshola	15.61	10.13	21.55	15.64	8.88	23.80
Delami	14.80	7.63	22.35	21.07	13.76	29.51
South Kordofan State	11.11	5.12	17.11	20.13	12.49	27.78
Abu Zabad	16.18	10.69	22.62	27.58	20.14	34.69
ElKhiwai	27.14	19.10	34.99	15.55	10.71	21.47
Ghubaish	5.38	3.01	7.85	23.56	15.83	32.04
El Nuhud	7.15	4.48	10.14	26.93	21.58	33.65
El Idia	13.35	9.26	18.68	18.74	11.69	26.33
Wad Benda	8.96	5.78	12.35	32.46	24.86	41.60
Lagawa	3.80	1.09	7.70	38.58	29.67	50.24
Elsunut	13.88	9.66	19.18	26.39	18.98	35.78
Keilik	11.23	7.05	15.63	22.91	17.59	29.02
Es Salam	27.40	22.11	32.87	28.05	23.92	32.87
Babanusa	7.81	4.11	11.93	16.70	11.12	23.88
Abyei	9.22	4.72	14.66	14.11	9.49	18.60
El Dibab	11.92	7.25	18.52	21.65	12.49	29.38
El Meiram	1.13	0.00	7.36	22.73	15.73	29.51
West Kordofan State	11.01	6.43	15.60	24.64	17.24	32.04
El Fasher	29.75	24.21	35.53	15.54	10.58	20.74
Tawila	39.20	29.66	54.25	15.69	10.02	21.53
Melit	17.52	10.42	24.52	27.18	20.27	32.78
Um Kadada	30.76	23.76	38.96	33.77	27.44	41.40
Kebkabiya	45.48	38.80	51.55	22.43	16.80	28.47
Kutum	9.59	6.18	13.82	9.96	6.27	13.74
El Mahalha	16.58	9.57	24.23	7.72	3.83	12.65
Saraf Omra	15.04	9.01	22.70	44.84	30.19	57.89
El Serief	20.97	13.43	30.95	76.16	70.35	81.93
Dar Elsalam	6.28	3.81	9.66	6.59	2.84	11.50
Kelemando	11.56	7.53	16.03	8.09	5.44	11.15
El Tawisha	2.71	1.12	4.82	22.37	17.40	28.59
Um Baru	10.43	5.12	19.31	0.81	0.00	14.91
El Lait	31.13	22.89	40.11	16.89	10.70	23.83
ELkuma	38.58	10.21	56.91	34.21	17.35	49.40
El Tina	0.00	0.00	0.00	66.67	33.33	88.89
Kernoi	24.31	16.63	32.31	30.60	24.38	37.11
North Darfur State	21.89	14.39	29.40	25.07	15.61	34.54
Nyala South	7.88	4.70	12.14	12.34	9.09	15.65

TABLE 78: Vitamin A supplementation by locality and by state

Location	Received Vitamin A Tablets Postpartum %			Experienced Night Blindness %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nyala North	5.43	0.00	12.73	10.81	3.12	17.07
Es Salam	7.78	4.18	12.31	26.86	22.16	32.59
El Wihda	7.44	3.93	12.76	44.48	35.72	52.20
Mershing	29.04	20.23	37.17	32.53	27.66	38.25
Beliel	13.98	10.57	18.20	31.58	24.78	38.17
Nitega	19.02	12.21	28.32	46.72	39.89	53.24
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	53.33	26.67	73.33
Kas	3.99	1.58	6.98	24.44	20.03	29.25
Shattaya	5.33	1.78	9.42	23.35	16.78	31.20
Buram	2.30	0.89	4.52	36.19	28.47	46.32
Gereida	14.13	9.60	19.61	20.60	14.81	27.14
El Sunta	10.80	6.25	15.86	35.51	27.53	42.91
El Radoum	4.89	2.21	8.01	34.36	25.65	43.41
Tulus	10.53	4.48	16.47	45.04	29.95	75.89
Damso	6.21	2.12	10.81	53.74	33.77	66.68
Ed Elfursan	4.66	2.21	9.74	31.97	25.28	37.78
Kubum	3.71	1.80	5.61	28.29	24.37	31.33
Kateila	3.92	2.01	7.45	18.33	11.83	26.70
Rehaid Elbirdi	3.30	1.12	6.39	47.99	42.00	55.48
Um Dafoug	0.25	0.00	1.23	58.09	49.60	67.27
South Darfur State	7.15	2.87	11.44	31.58	22.56	40.60
Abu Jabra	11.45	6.87	17.34	31.72	24.62	39.87
Abu Karinka	26.90	19.74	34.11	45.89	38.32	53.55
Bahr El Arab	5.66	2.19	10.00	0.64	0.00	2.52
Adila	19.90	10.83	30.07	12.29	6.74	19.15
Ed Dain	19.69	12.47	26.85	22.84	16.80	30.46
Assalaya	15.38	10.43	20.94	26.52	21.18	32.33
El Firdous	16.59	10.16	23.90	4.32	1.80	8.14
Shia-ria	4.74	2.30	7.15	20.30	11.70	29.60
Yassin	23.21	15.78	29.33	15.36	9.90	22.10
East Darfur State	16.15	9.73	22.57	20.24	13.70	26.77
El Geneina	17.23	12.66	22.55	4.33	2.13	7.38
Habila	9.70	3.82	19.17	2.24	0.60	4.71
Kulbus	12.47	5.77	19.98	2.09	0.64	4.00
Beida	36.23	29.00	42.70	1.50	0.33	3.18
Foro Baranga	6.93	3.91	11.05	1.24	0.18	3.20
Kereneik	9.83	6.77	12.96	24.14	19.06	29.36

TABLE 78: Vitamin A supplementation by locality and by state

Location	Received Vitamin A Tablets Postpartum %			Experienced Night Blindness %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sirba	6.69	2.86	12.95	4.12	1.93	7.07
Jebel Moon	21.35	8.76	36.39	5.29	0.00	12.64
West Darfur State	15.47	8.53	22.40	5.82	2.35	9.28
Zalingi	45.08	36.92	53.42	10.91	7.06	16.82
Wadi Salih	8.92	3.55	17.14	0.45	0.00	1.25
Mukjar	0.00	0.00	0.43	0.00	0.00	0.44
Central Jebel Mara	6.71	1.57	12.84	0.00	0.00	0.00
North Jebel Mara	0.00	0.00	0.00	10.14	3.60	17.34
Bendasi	0.00	0.00	1.31	2.63	0.00	6.68
Nertiti	34.33	27.18	41.51	13.78	9.43	19.77
Azum	40.82	28.38	51.90	36.16	28.48	42.54
Um Dukhun	14.44	7.19	23.37	6.88	2.06	14.37
Central Darfur State	14.29	7.92	20.66	7.06	2.85	11.28

Spatial distribution of postpartum vitamin A supplementation and night blindness

There was an even spatial spread of low coverage of women who received postpartum vitamin A tablets, with small areas of high coverage in the central areas of Khartoum state and Kassala state as well as the south-western coast of Red Sea state *(see Figure 274).*

There was a spatial trend of night blindness prevalence increasing from the east to the West of Sudan, with the highest prevalence in parts of South and East Darfur states, Western areas of North Darfur state, and parts of West Kordofan state *(see Figure 276).*

FIGURE 274:
ANC: Received vitamin A tablets postpartum (most recent birth) (raster)

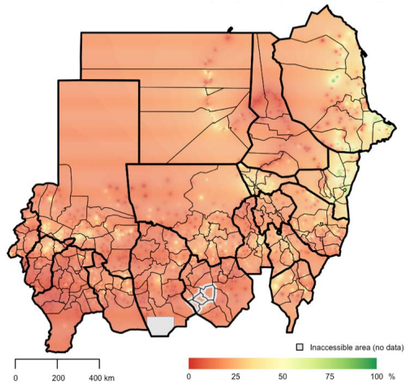


FIGURE 275:
ANC: Received vitamin A tablets postpartum (most recent birth)

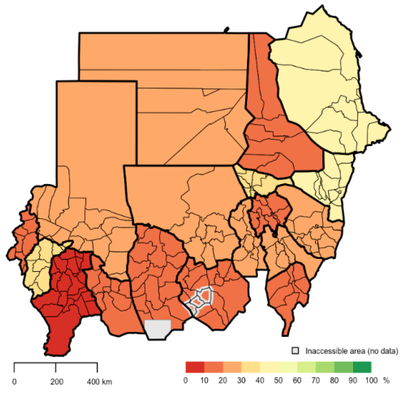


FIGURE 276:
ANC: Experienced night-blindness during most recent pregnancy (raster)

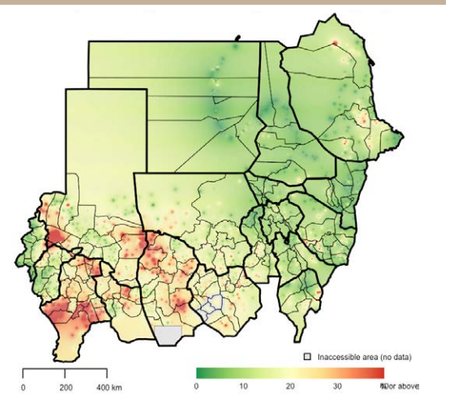
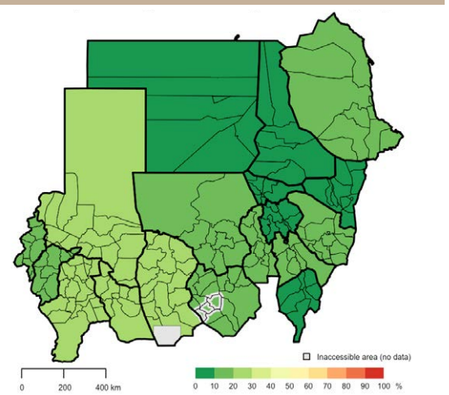


FIGURE 277:
ANC: Experienced night-blindness during most recent pregnancy



Postpartum care coverage average results

Postpartum care coverage is the percentage of mothers and babies who received postpartum care within two days of childbirth (regardless of place of delivery).[48] Postpartum care coverage among women carers was low at 34.2 per cent (95 per cent CI 25.1-43.3 per cent) for the whole of Sudan.

At the state level, Northern state had the highest rate of postpartum care coverage at 64.7 per cent (95 per cent CI 56.6-72.9 percent). Central Darfur state had the lowest postpartum care coverage at 7.9 per cent (95 per cent CI 2.6-13.2 percent). Across the localities, Agig locality in Red Sea state had the highest rate of postpartum care coverage at 86.42 per cent (95 per cent CI 76.34-92.25 percent). Four localities had rates of postpartum care that were zero per cent or close to zero per cent: Sharg El Jabal (accessible parts) and Rehaid Elbirdi in South Darfur; Mukjar in Central Darfur; and Bahr El Arab in East Darfur. Many more had postpartum care coverage of less than 10 per cent.

Maternal tetanus vaccination average results

One important element of antenatal or early postnatal care is the administration of the tetanus vaccine. It is recommended that pregnant mothers receive the vaccine during pregnancy at one of their ANC visits; but if this does not happen, then their babies should receive it shortly after birth.

Tetanus vaccination rates were relatively high at 67.3 per cent (95 per cent CI 58.5-76.2 per cent) for the whole of Sudan. At the state level, Khartoum had a very high rate of tetanus vaccination at 85 per cent (95 per cent CI 78.7-91.4 percent). Central Darfur state had the lowest tetanus vaccination rate at 38 per cent (95 per cent CI 24.7-51.3 percent). At the locality level, Beliel locality in South Darfur state had the highest rate of tetanus vaccination at 93.47 per cent (95 per cent CI 90.57-96.18 percent). Bahr El Arab locality in East Darfur state and Haya locality in Red Sea state had the lowest rates of tetanus vaccination at 9.78 per cent (95 per cent CI 3.77-16.04 per cent) and 4.24 per cent (95 per cent CI 1.67-7.79 percent), respectively. These results were significantly lower than results in all other localities in Sudan *(see Figure 278).*

[48] World Health Organization, '2015 Global Reference List of 100 Core Health Indicators', WHO, Geneva, 2015. <http://apps.who.int/iris/bitstream/10665/173589/1/WHO_HIS_HSI_2015.3_eng.pdf>

FIGURE 278: Box plot of state and locality results of postnatal care and tetanus vaccination

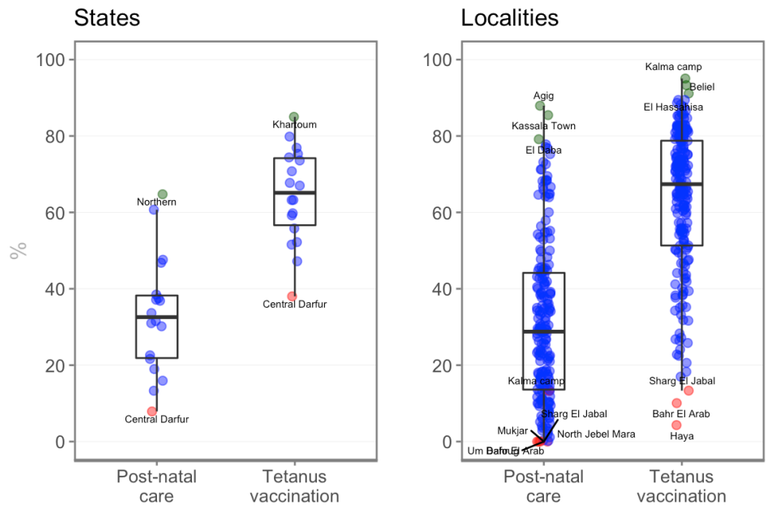


TABLE 79: Postpartum care by state and national

State	Received Postnatal Care %			Received Tetanus Vaccination 2 doses %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	31.53	22.30	40.77	67.01	56.84	77.18
Al-Gazeera	38.47	28.48	48.46	76.91	69.83	83.99
Blue Nile	36.85	26.07	47.63	74.39	65.81	82.98
Central Darfur	7.89	2.57	13.21	38.02	24.74	51.30
East Darfur	13.31	7.82	18.80	47.21	37.87	56.55
Kassala	60.70	51.68	69.72	59.77	51.04	68.50
Khartoum	37.14	27.31	46.97	85.01	78.65	91.36
North Darfur	33.64	23.57	43.70	59.21	47.85	70.57
North Kordofan	47.60	38.04	57.15	63.24	55.85	70.63
Northern	64.74	56.57	72.90	79.83	72.76	86.89
Red Sea	37.53	28.07	46.99	51.56	42.04	61.08
River Nile	30.99	21.68	40.30	75.32	67.45	83.20
Sennar	18.98	12.47	25.48	67.73	59.20	76.26
South Darfur	15.92	9.54	22.29	52.22	42.41	62.03
South Kordofan	30.18	17.96	42.39	73.59	63.25	83.94
West Darfur	22.57	14.30	30.85	63.22	52.43	74.02
West Kordofan	21.63	12.09	31.16	55.79	45.06	66.53
White Nile	46.80	37.63	55.97	70.77	62.73	78.82
Sudan	34.20	25.06	43.34	67.34	58.54	76.15

TABLE 80: Postpartum care by locality and by state

Location	Received Postnatal Care %			Received Tetanus Vaccination 2 doses %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	65.27	56.58	73.98	84.06	76.60	89.84
El Golid	75.52	66.18	84.28	73.27	68.06	79.07
Merwoe	64.87	57.14	71.19	70.48	59.33	81.80
El Daba	79.26	71.06	86.19	90.00	86.07	93.42
Halfa	40.47	32.61	47.68	81.93	76.00	86.59
Delgo	26.64	21.98	32.11	61.12	51.59	69.13
El Burgaig	57.23	49.15	64.68	85.60	80.58	90.19
Northern State	64.74	56.57	72.90	79.83	72.76	86.89
El Matama	43.25	34.45	50.42	87.29	81.09	93.36
Shendi	32.24	21.90	46.02	81.21	73.42	88.31
Abu Hamad	23.35	15.05	29.84	53.06	42.97	62.74
Barbar	11.17	6.88	18.49	68.36	56.46	76.25
El Damar	25.86	19.85	32.75	70.35	61.43	78.66
Atbara	48.56	37.31	60.86	89.30	83.29	93.32
El Buhaira	53.97	45.52	62.05	75.49	66.09	82.29
River Nile State	30.99	21.68	40.30	75.32	67.45	83.20
Khartoum	29.80	20.06	40.91	81.97	75.21	87.77
Bahri	50.92	38.04	65.73	84.95	76.52	91.33
Um Durman	70.39	64.49	76.78	87.80	82.28	92.17
Um Bada	25.14	16.89	36.20	83.37	74.65	89.97
Jebel Awlia	18.02	10.90	26.59	88.07	82.22	93.06
Sharg Elneel	39.54	32.07	49.23	83.61	78.40	88.10
Karrari	46.43	35.06	57.74	85.09	79.53	90.74
Khartoum State	37.14	27.31	46.97	85.01	78.65	91.36
Greater Medani	41.25	31.91	49.92	67.78	59.70	74.71
Ganub Elgazira	47.91	36.03	59.30	84.93	78.49	89.96
El Hassahisa	59.66	47.97	70.63	88.95	80.85	94.51
El Kamlin	66.46	54.51	77.42	75.98	67.61	82.89
Sharg El Gezira	28.89	22.49	36.16	73.75	65.61	81.04
Um Elqura	33.40	25.69	40.99	77.91	70.61	84.61
El Manaqil	23.93	15.14	35.18	67.77	60.30	76.07
El Qurashi	13.55	8.44	19.17	81.05	74.49	86.61
Al-Gazeera State	38.40	34.11	43.07	76.44	73.50	79.22
Sennar	34.54	27.96	41.64	82.40	77.62	86.77
Sharg Sennar	7.07	3.66	11.74	50.44	37.79	62.52
Sinja	14.81	9.70	21.93	80.86	71.17	88.43
Abu Hujar	10.96	6.71	16.99	50.22	40.14	61.25
El Dali	6.86	4.12	10.82	65.53	54.03	76.34
Es Suki	34.33	24.89	45.70	70.82	62.15	78.66

TABLE 80: Postpartum care by locality and by state

Location	Received Postnatal Care %			Received Tetanus Vaccination 2 doses %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ed Dinder	5.95	2.74	10.23	64.35	55.89	70.84
Sennar State	18.98	12.47	25.48	67.73	59.20	76.26
Ed Damazine	23.80	18.05	30.57	80.78	74.16	86.67
El Tadamon	72.70	66.07	79.26	59.85	46.75	75.00
El Roseiris	22.30	16.31	29.02	73.05	64.60	79.24
Baw	75.22	57.12	84.87	78.27	69.22	85.42
Geisan	64.21	39.36	83.16	76.32	69.63	82.46
El Kurmuk	16.91	7.88	27.03	65.27	52.45	77.92
Wad El Mahi	21.34	11.04	33.48	77.69	67.57	86.42
Blue Nile State	36.85	26.07	47.63	74.39	65.81	82.98
Kosti	69.82	62.44	76.53	75.45	65.62	82.28
Guli	39.89	27.29	55.44	62.62	54.45	69.82
Tendalti	26.89	20.79	33.95	72.10	62.91	80.05
Es Salam	38.95	32.15	46.50	60.61	53.08	66.67
Rabak	44.95	38.45	51.55	66.28	58.46	73.83
El Jabalain	50.38	42.01	58.33	76.81	68.27	83.93
El Diwaim	38.36	26.60	54.37	79.46	68.85	87.31
Um Rimta	35.10	28.92	43.99	63.37	54.18	69.86
El Gitaina	39.96	33.13	47.49	66.06	59.42	72.54
White Nile State	46.80	37.63	55.97	70.77	62.73	78.82
Port Sudan	34.32	28.07	40.00	81.22	72.39	88.25
Swakin	28.81	20.49	39.39	36.67	27.36	45.00
El Gonob Welawlaib	49.28	36.38	59.05	62.67	48.52	73.70
Sinkat	61.61	49.86	73.32	50.30	39.88	59.41
Haya	8.36	4.03	13.36	4.24	1.67	7.79
Dordieb	26.15	14.25	37.79	59.05	46.36	72.23
Tokar	68.88	56.18	77.99	81.65	72.19	87.29
Agig	86.42	76.34	92.25	69.63	57.04	81.09
Gabaot Elma-aadin	35.04	24.45	45.99	63.22	49.99	73.01
Halaeeb (accessible parts)	18.28	6.24	34.09	59.05	44.29	73.61
Red Sea State	37.53	28.07	46.99	51.56	42.04	61.08
Kassala Town	85.60	76.87	92.30	89.72	83.02	94.71
Refi Kassla	72.22	61.14	82.91	77.09	70.62	83.20
Rural Western Kassala	75.34	67.93	82.63	47.42	37.34	57.94
New Halfa	65.11	56.34	74.19	66.67	59.69	74.12
Refi Nahr Atbara	27.31	18.70	36.56	50.63	41.03	62.01
Rural Khashm Elgirba	68.54	61.13	76.58	64.72	56.93	71.29
Rural Wad Elhilaiw	49.25	40.25	59.53	69.33	58.26	80.56

TABLE 80: Postpartum care by locality and by state

Location	Received Postnatal Care %			Received Tetanus Vaccination 2 doses %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Aroma	29.14	19.54	38.52	18.00	7.39	31.00
Refi North Delta	14.21	7.14	21.67	43.11	33.17	54.32
Refi Hamashkureib	70.32	57.06	80.28	44.92	36.23	52.30
Rural Telkok	55.10	47.62	61.49	49.88	41.57	60.02
Kassala State	60.70	51.68	69.72	59.77	51.04	68.50
Gedaref Town	43.21	34.44	52.58	78.92	68.36	88.97
Middle Geddaref	35.82	23.74	51.27	81.86	72.78	88.67
Elbutana	35.93	26.15	44.70	81.95	74.27	88.73
El Fashaga	41.05	27.84	56.13	65.18	52.11	79.26
El Rahad	20.73	13.59	29.12	29.78	17.11	46.61
Gala-a El Nahal	42.09	32.30	51.41	71.43	58.53	83.36
El Fao	41.30	33.90	47.88	64.15	54.14	74.21
El Qureisha	50.87	39.57	61.90	71.32	62.49	78.59
El Mafaza	34.19	25.89	40.57	66.53	56.53	75.20
Basunda	12.71	7.29	18.99	68.46	58.98	76.38
Western Galabat	16.89	8.12	27.36	81.00	72.78	88.26
Eastern Galabat	7.85	4.32	12.18	69.36	62.04	77.14
Al-Gadarif State	31.53	22.30	40.77	67.01	56.84	77.18
Sheikan	50.31	43.83	55.86	75.45	69.62	80.99
Um Rawaba	59.87	48.84	70.92	69.53	63.31	76.40
Um Dam Haj Ahmed	53.77	45.58	63.84	75.76	68.89	81.75
El Rahad	46.19	36.73	55.94	74.75	67.84	80.73
Bara	46.92	40.75	54.14	54.43	45.78	64.47
Gharb Bara	29.32	21.79	39.25	60.26	51.92	67.91
Soudari	35.57	25.22	45.44	30.27	21.78	40.30
Gebrat El Sheikh	47.69	34.13	60.94	57.31	50.20	63.56
North Kordofan State	47.60	38.04	57.15	63.24	55.85	70.63
Kadugli	39.53	32.54	46.63	79.53	74.76	84.53
Reif Shargi	26.69	18.83	35.23	81.70	75.76	87.29
Dilling	30.61	15.04	51.13	58.09	39.26	74.09
El Quoz	22.05	12.32	32.77	81.78	76.31	86.63
Habila	23.50	11.46	38.15	80.40	73.17	87.63
Abassiya	28.29	17.48	39.25	80.12	70.72	87.50
El Rashad	29.70	15.15	48.19	64.86	49.43	80.75
Abu Jubaiha	25.24	15.81	34.60	70.22	62.78	76.42
El Tadamon	17.21	9.49	26.88	59.66	49.19	71.25
Talodi	41.26	27.45	60.28	71.83	61.59	80.58
Ghadeer	53.26	40.55	65.94	80.67	69.91	91.90
El Leri	49.49	41.75	56.38	73.97	67.01	80.62

TABLE 80: Postpartum care by locality and by state

Location	Received Postnatal Care %			Received Tetanus Vaccination 2 doses %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Karshola	34.24	23.53	43.34	81.76	74.78	88.00
Delami	56.64	40.40	71.01	79.60	69.90	87.79
South Kordofan State	30.18	17.96	42.39	73.59	63.25	83.94
Abu Zabad	24.75	14.03	37.50	63.65	53.33	72.93
ElKhiwai	4.00	1.65	7.22	61.46	51.13	68.94
Ghubaish	19.06	9.62	29.96	61.51	49.11	72.33
El Nuhud	14.23	7.47	22.40	42.03	30.92	53.74
El Idia	22.82	13.62	32.16	65.50	53.50	76.26
Wad Benda	27.61	18.09	37.77	34.43	23.58	46.43
Lagawa	41.26	29.90	50.93	72.00	65.24	78.17
Elsunut	41.97	28.28	58.82	72.33	60.72	82.54
Keilik	28.89	21.30	37.33	54.59	49.37	60.49
Es Salam	37.76	32.04	43.34	76.26	69.15	83.02
Babanusa	5.96	2.99	8.87	79.29	65.07	91.08
Abyei	10.70	5.69	17.28	49.01	42.50	56.17
El Dibab	17.71	11.28	26.21	44.56	32.81	57.73
El Meiram	3.95	0.00	13.09	41.21	32.38	51.57
West Kordofan State	21.63	12.09	31.16	55.79	45.06	66.53
El Fasher	42.88	36.75	49.18	65.32	60.83	70.06
Tawila	16.70	8.11	26.17	52.59	41.20	64.40
Melit	31.56	22.01	39.93	53.47	40.56	64.01
Um Kadada	77.47	70.00	84.46	65.73	58.49	73.12
Kebkabiya	34.78	27.91	39.86	65.60	54.61	74.63
Kutum	20.04	13.43	26.62	64.03	55.96	71.06
El Mahalha	23.55	13.90	30.99	53.66	39.07	67.07
Saraf Omra	13.54	7.57	19.96	33.55	22.87	44.78
El Serief	14.04	8.51	18.99	41.31	32.89	48.41
Dar Elsalam	9.84	4.96	15.13	84.85	79.10	89.17
Kelemando	20.35	13.10	28.09	77.38	68.47	84.44
El Tawisha	64.80	57.87	71.03	46.67	38.24	54.49
Um Baru	21.40	12.73	34.04	79.13	66.17	89.27
El Lait	28.19	21.79	35.61	51.21	43.82	58.41
ELkuma	68.71	42.75	82.24	65.00	36.36	80.51
El Tina	66.67	33.33	100.00	44.44	11.11	77.78
Kernoi	53.24	44.32	61.41	64.07	53.42	73.03
North Darfur State	33.64	23.57	43.70	59.21	47.85	70.57
Nyala South	33.70	27.37	38.65	87.75	83.21	91.48
Nyala North	29.47	15.63	45.65	76.39	65.12	87.32
Es Salam	16.32	11.87	21.18	61.55	52.88	70.75

TABLE 80: Postpartum care by locality and by state

Location	Received Postnatal Care %			Received Tetanus Vaccination 2 doses %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Wihda	2.01	0.00	6.07	74.47	63.31	82.00
Mershing	12.60	6.89	18.33	72.76	66.38	79.12
Beliel	12.68	8.27	17.13	93.47	90.57	96.18
Nitega	26.80	20.31	33.77	41.54	30.90	52.77
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	13.33	0.00	33.33
Kas	5.07	2.26	8.68	54.31	41.69	66.01
Shattaya	1.75	0.65	3.30	49.46	32.47	65.90
Buram	34.70	27.34	40.73	39.39	30.92	49.45
Gereida	8.10	3.51	14.46	75.09	66.53	81.93
El Sunta	44.06	36.35	51.72	48.16	36.81	58.82
El Radoum	10.74	6.27	15.59	21.43	13.01	29.88
Tulus	10.39	4.99	18.36	38.17	23.62	49.62
Damso	12.89	5.65	21.01	26.71	17.82	35.52
Ed Elfursan	8.72	5.36	12.34	34.64	28.68	41.24
Kubum	6.66	3.96	10.30	54.28	44.32	63.33
Kateila	2.84	0.90	5.18	31.55	24.81	40.60
Rehaid Elbirdi	0.18	0.00	1.15	38.37	27.60	48.84
Um Dafoug	0.00	0.00	0.99	21.08	13.38	30.22
South Darfur State	20.38	18.55	22.20	67.46	64.48	70.63
Abu Jabra	24.67	16.66	33.19	50.22	39.21	58.94
Abu Karinka	32.43	25.81	39.22	61.82	56.29	67.28
Bahr El Arab	0.00	0.00	1.26	9.78	3.77	16.04
Adila	16.31	10.46	24.24	55.17	42.30	69.35
Ed Dain	18.65	13.49	27.38	80.68	73.41	86.89
Assalaya	9.43	4.71	16.24	61.38	51.84	70.16
El Firdous	3.85	1.61	6.84	30.41	19.67	45.00
Shia-ria	1.14	0.00	2.82	19.56	13.94	27.23
Yassin	8.57	5.21	12.79	58.16	45.50	70.20
East Darfur State	13.31	7.82	18.80	47.21	37.87	56.55
El Geneina	35.61	27.18	45.14	72.01	64.56	78.66
Habila	17.84	7.68	28.41	46.93	30.59	62.10
Kulbus	19.57	10.73	27.67	68.35	56.50	78.74
Beida	38.12	29.04	44.18	73.30	61.13	85.58
Foro Baranga	23.10	13.49	32.81	23.09	14.54	33.77
Kereneik	16.55	10.69	23.43	82.47	77.59	86.74
Sirba	4.67	1.71	9.54	59.89	49.67	71.10
Jebel Moon	7.58	2.11	16.01	48.40	34.09	62.88

TABLE 80: Postpartum care by locality and by state

Location	Received Postnatal Care %			Received Tetanus Vaccination 2 doses %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
West Darfur State	22.57	14.30	30.85	63.22	52.43	74.02
Zalingi	17.22	11.64	22.62	62.97	54.98	70.43
Wadi Salih	13.25	5.92	23.83	37.95	24.18	53.43
Mukjar	0.00	0.00	0.23	26.19	10.71	46.18
Central Jebel Mara	8.57	2.20	17.53	23.53	14.81	31.74
North Jebel Mara	0.00	0.00	0.00	26.57	17.56	36.44
Bendasi	0.34	0.00	1.70	30.87	17.88	44.93
Nertiti	25.38	19.48	30.50	49.02	37.53	60.37
Azum	14.07	8.52	19.52	68.78	53.63	81.78
Um Dukhun	3.54	1.85	5.45	34.97	23.29	49.11
Central Darfur State	15.49	13.07	17.87	51.43	46.62	55.85

Spatial distribution of postpartum care coverage and maternal tetanus vaccination

There was a decreasing trend of postnatal care coverage from east to west with the lowest rates in most of the Darfur states, West Kordofan state, Sennar state and southern areas of Al-Gadarif state There were areas of high prevalence of postnatal care in the southeast of North Kordofan state, the south of North Kordofan state, central areas of Northern state, central areas of Kassala state and the eastern area of Red Sea state *(see Figure 279)*.

There was an even spatial spread of high coverage of postnatal tetanus vaccination in the country, except for small areas of low coverage in South, Central and East Darfur states, northern areas of West Kordofan state, northern areas of Kassala state, and central areas of Red Sea state *(see Figure 281)*.

FIGURE 279:
ANC: Received postnatal care (most recent birth) (raster)

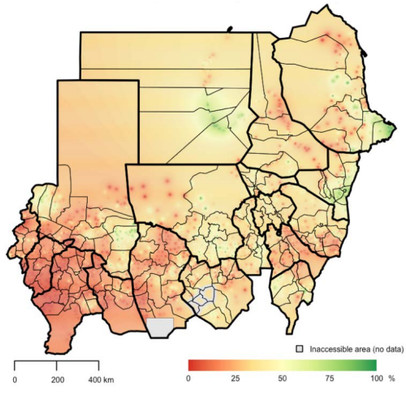


FIGURE 280:
ANC: Received postnatal care (most recent birth)

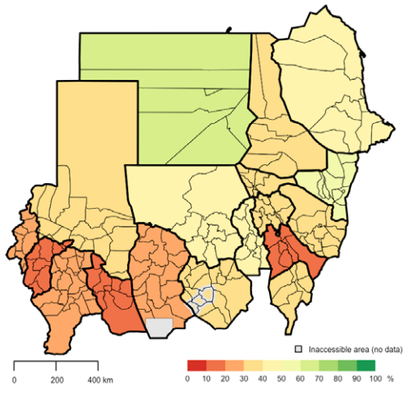


FIGURE 281:
ANC: Received tetanus vaccination (2 doses) (raster)

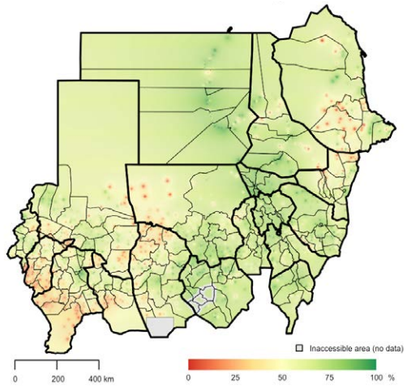
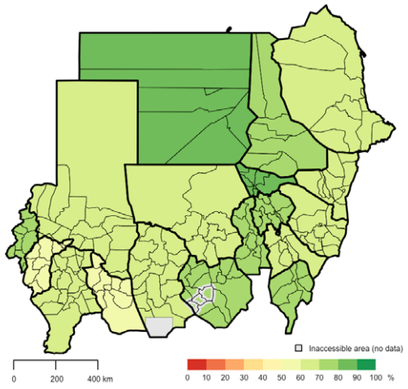


FIGURE 282:
ANC: Received tetanus vaccination (2 doses)



3.14 Coverage of expanded program on immunization (EPI)

The expanded program on immunization (EPI) forms the foundation of global public health action for child survival and disease prevention. Achieving high EPI coverage is important in ensuring program effectiveness. In Sudan, a child will receive a vaccine against tuberculosis-BCG, or Bacille Calmette-Guerin, at birth, three doses of a pentavalent vaccine and three doses of an oral polio vaccine before six months, and a measles vaccine of two doses. The availability of a child vaccination card and BCG coverage are good proxies for initial access to EPI services.

3.14.1 Access to EPI services (vaccine card and BCG vaccination)

The availability of a child vaccination card and BCG[49] coverage are good proxies for initial access or contact to EPI services. The proportion of children younger than 24 months old who had a vaccination card in Sudan was 61.7 per cent (95 per cent CI 51.0-72.5 percent). Blue Nile state had the highest proportion of children younger than 24 months old with a vaccination card, and Central Darfur state had the lowest proportion *(see Figure 283)*.

Access to EPI services average results

BCG vaccine coverage of children younger than 12 months old was 77.6 per cent (95 per cent CI 67.1-88.1 per cent) across Sudan. Blue Nile state had the highest BCG coverage, while Central Darfur had the lowest coverage *(see Figure 283*). Only 11.9 per cent of localities had 80 per cent or more of children less than 24 months old with a vaccination card, and 48.1 per cent of localities had 80 per cent or more of children less than 12 months with a BCG vaccination *(see Figure 283)*.

Table 81 and Table 82 present per locality, per state and national level results for children under 24 months with vaccination cards and children under 12 months who had a BCG vaccination.

[49] BCG or Bacille Calmette-Guerin, is a vaccine for tuberculosis (TB) disease.

FIGURE 283: Box plot of state and locality results for EPI access indicators

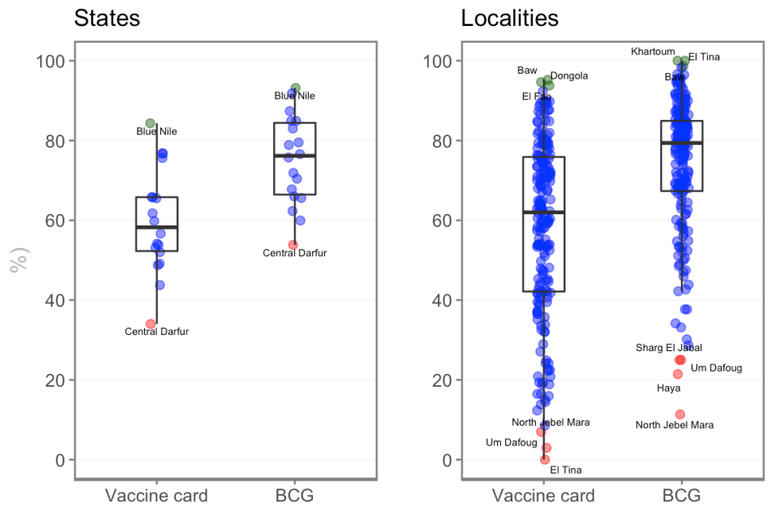


TABLE 81: Access to EPI services by state and national

State	Vaccine card available / seen for children below 24 months			BCG coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	75.62	66.53	84.72	84.89	76.30	93.49
Al-Gazeera	65.52	54.71	76.32	84.94	76.70	93.18
Blue Nile	84.32	77.15	91.50	93.18	86.62	99.74
Central Darfur	34.02	18.63	49.40	53.83	37.64	70.03
East Darfur	48.77	37.42	60.12	59.94	46.92	72.95
Kassala	61.76	52.71	70.80	78.88	69.87	87.89
Khartoum	76.83	67.23	86.43	91.85	85.62	98.08
North Darfur	52.02	42.17	61.86	70.43	57.20	83.66
North Kordofan	54.16	43.39	64.93	67.77	57.70	77.84
Northern	76.72	62.26	91.19	87.36	77.05	97.66
Red Sea	53.12	40.14	66.10	65.60	52.05	79.14
River Nile	59.80	49.53	70.08	75.74	65.80	85.69
Sennar	65.80	56.58	75.02	76.59	67.05	86.14
South Darfur	43.75	31.61	55.90	66.00	51.22	80.77
South Kordofan	56.68	44.47	68.90	79.52	69.98	89.07
West Darfur	49.13	38.44	59.82	71.87	62.12	81.61
West Kordofan	53.82	41.54	66.10	62.32	48.72	75.93

TABLE 81: Access to EPI services by state and national

State	Vaccine card available / seen for children below 24 months			BCG coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
White Nile	65.77	55.77	75.77	83.01	73.58	92.45
Sudan	61.74	50.98	72.50	77.58	67.10	88.07

TABLE 82: Access to EPI services by locality and by state

Location	Vaccine card available / seen for children below 24 months			BCG coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	94.96	90.68	98.14	91.85	84.61	97.98
El Golid	90.14	84.25	94.50	84.24	73.45	93.30
Merwoe	73.21	57.08	89.30	71.70	53.73	86.06
El Daba	58.63	36.65	81.73	95.90	88.86	99.31
Halfa	75.98	64.76	84.86	95.54	91.02	98.98
Delgo	61.74	47.38	77.10	92.65	85.16	97.89
El Burgaig	75.67	65.32	83.81	88.50	77.14	95.92
Northern State	76.72	62.26	91.19	87.36	77.05	97.66
El Matama	77.03	66.76	85.22	82.73	73.29	91.73
Shendi	63.85	51.89	74.55	69.81	57.96	81.16
Abu Hamad	64.20	53.98	71.63	81.77	73.83	88.89
Barbar	57.55	47.47	66.56	80.53	68.87	89.93
El Damar	45.21	35.97	53.58	68.42	58.14	77.47
Atbara	61.61	47.68	72.75	82.94	74.22	89.18
El Buhaira	57.37	45.55	69.35	83.77	75.34	91.07
River Nile State	59.80	49.53	70.08	75.74	65.80	85.69
Khartoum	78.41	68.61	85.20	100.00	98.10	100.00
Bahri	65.74	50.86	78.76	90.15	80.88	96.74
Um Durman	71.57	60.84	80.99	95.62	90.96	98.83
Um Bada	89.22	80.77	94.68	92.34	85.85	96.70
Jebel Awlia	79.03	69.09	87.72	90.55	83.19	96.80
Sharg Elneel	71.20	60.13	79.41	90.48	82.28	96.96
Karrari	78.15	69.32	87.28	86.24	78.47	92.86
Khartoum State	76.83	67.23	86.43	91.85	85.62	98.08
Greater Medani	60.96	51.25	70.41	82.47	73.76	90.20
Ganub Elgazira	58.76	48.35	70.49	84.71	72.59	93.18

TABLE 82: Access to EPI services by locality and by state

Location	Vaccine card available / seen for children below 24 months			BCG coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Hassahisa	61.24	49.27	75.72	85.45	76.97	92.71
El Kamlin	74.23	67.32	82.01	81.76	73.34	88.58
Sharg El Gezira	79.15	67.53	87.19	83.33	71.61	90.92
Um Elqura	65.24	56.63	72.97	80.42	68.62	89.71
El Manaqil	54.46	42.72	66.05	89.50	82.63	94.55
El Qurashi	82.13	73.98	88.39	84.34	77.12	91.48
Al-Gazeera State	65.52	54.71	76.32	84.94	76.70	93.18
Sennar	76.40	66.42	84.10	80.71	72.99	86.83
Sharg Sennar	75.00	66.67	81.66	84.65	76.89	90.83
Sinja	72.22	61.98	81.30	90.91	83.56	96.28
Abu Hujar	34.75	25.17	45.59	52.55	42.22	65.03
El Dali	61.18	50.68	72.15	60.00	47.40	71.51
Es Suki	63.75	55.23	73.41	73.96	61.56	84.98
Ed Dinder	56.84	49.51	65.42	75.86	61.25	86.43
Sennar State	65.80	56.58	75.02	76.59	67.05	86.14
Ed Damazine	65.75	55.96	74.81	88.64	83.39	93.10
El Tadamon	85.16	80.10	90.01	96.73	93.10	99.46
El Roseiris	91.40	85.36	95.55	96.37	93.10	98.82
Baw	94.77	89.93	97.60	97.97	92.41	100.00
Geisan	89.91	84.40	94.01	88.05	80.40	94.61
El Kurmuk	87.17	72.77	95.72	89.86	74.07	100.00
Wad El Mahi	87.26	82.36	91.23	96.07	90.56	99.51
Blue Nile State	84.32	77.15	91.50	93.18	86.62	99.74
Kosti	75.77	65.70	85.02	83.09	76.05	90.06
Guli	79.89	70.30	88.57	80.73	66.65	90.57
Tendalti	17.83	7.49	32.59	76.12	58.81	87.63
Es Salam	79.03	69.26	85.35	61.54	49.18	72.38
Rabak	59.31	49.20	68.32	84.02	77.97	89.35
El Jabalain	75.21	68.56	81.08	88.14	79.96	94.32
El Diwaim	47.77	37.59	59.55	82.43	70.59	91.57
Um Rimta	78.93	65.60	88.08	76.84	63.20	87.03
El Gitaina	79.93	69.63	88.19	95.00	84.99	100.00
White Nile State	65.77	55.77	75.77	83.01	73.58	92.45
Port Sudan	88.33	78.07	95.46	91.07	84.91	96.02
Swakin	89.24	81.42	94.58	88.89	76.80	96.59
El Gonob Welawlaib	21.20	12.59	29.52	62.16	47.19	78.07

TABLE 82: Access to EPI services by locality and by state

Location	Vaccine card available / seen for children below 24 months			BCG coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sinkat	39.31	28.60	49.88	66.19	49.15	80.04
Haya	32.16	19.06	43.58	22.11	10.16	35.73
Dordieb	16.08	8.79	24.26	56.42	43.03	66.68
Tokar	39.38	29.01	49.24	83.76	71.50	91.95
Agig	56.79	41.95	70.63	82.64	68.19	93.39
Gabaot Elma-aadin	71.29	61.22	79.19	78.00	67.56	88.77
Halaeeb (accessible parts)	78.00	38.36	94.90	79.63	33.23	94.12
Red Sea State	53.12	40.14	66.10	65.60	52.05	79.14
Kassala Town	90.18	81.34	96.47	94.97	88.48	98.90
Refi Kassla	66.48	55.71	77.04	90.57	84.18	96.09
Rural Western Kassala	75.69	68.10	81.49	78.07	69.35	86.33
New Halfa	73.21	64.78	79.06	81.67	73.61	88.24
Refi Nahr Atbara	79.43	72.44	86.19	83.50	74.74	91.08
Rural Khashm Elgirba	76.56	69.00	83.61	80.19	74.23	86.25
Rural Wad Elhilaiw	81.61	72.68	88.83	79.42	69.91	87.55
Rural Aroma	32.37	19.75	46.52	69.41	52.04	81.77
Refi North Delta	38.86	24.22	51.84	62.24	44.74	78.06
Refi Hamashkureib	20.21	12.84	28.05	86.52	77.67	93.67
Rural Telkok	49.03	39.12	57.63	51.27	38.50	62.43
Kassala State	61.76	52.71	70.80	78.88	69.87	87.89
Gedaref Town	85.37	76.17	91.93	82.98	74.78	91.54
Middle Geddaref	77.11	65.35	87.61	94.66	88.54	98.82
Elbutana	29.41	20.96	37.78	78.37	67.42	87.44
El Fashaga	79.04	70.94	85.96	86.58	75.79	96.62
El Rahad	50.27	38.94	62.69	71.24	61.85	80.30
Gala-a El Nahal	63.84	50.90	77.56	83.02	69.79	93.38
El Fao	92.39	87.47	95.96	87.44	79.65	92.80
El Qureisha	90.44	85.33	94.62	91.16	86.02	96.90
El Mafaza	71.90	61.08	83.11	84.44	71.94	94.39
Basunda	79.40	68.25	86.96	81.82	74.88	88.53
Western Galabat	71.67	63.71	79.59	89.12	81.22	94.79
Eastern Galabat	88.00	81.26	94.06	93.71	88.13	98.28
Al-Gadarif State	75.62	66.53	84.72	84.89	76.30	93.49
Sheikan	62.38	52.26	70.75	77.81	71.27	83.38
Um Rawaba	62.88	52.43	73.00	66.76	56.59	75.77

TABLE 82: Access to EPI services by locality and by state

Location	Vaccine card available / seen for children below 24 months			BCG coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Um Dam Haj Ahmed	62.61	53.22	72.25	78.44	70.25	86.32
El Rahad	56.25	45.81	67.03	75.46	64.82	86.40
Bara	57.79	49.21	66.29	62.38	50.27	72.21
Gharb Bara	47.16	34.61	61.48	64.90	49.76	75.94
Soudari	22.50	13.77	32.23	39.55	27.54	52.83
Gebrat El Sheikh	51.28	35.90	65.81	70.76	57.98	81.93
North Kordofan State	54.16	43.39	64.93	67.77	57.70	77.84
Kadugli	62.41	55.48	69.73	84.59	78.74	90.34
Reif Shargi	70.48	57.31	82.21	83.33	74.69	92.00
Dilling	50.00	35.18	62.57	80.00	68.64	90.20
El Quoz	56.55	47.58	64.55	81.86	73.25	87.88
Habila	65.16	58.32	72.15	88.37	80.98	94.01
Abassiya	55.61	45.08	64.86	84.72	77.56	91.38
El Rashad	54.20	43.23	64.13	83.71	76.63	90.86
Abu Jubaiha	51.25	39.56	62.06	72.58	60.43	80.81
El Tadamon	46.07	36.36	53.68	62.69	47.75	75.00
Talodi	45.76	20.71	76.36	83.05	67.67	94.64
Ghadeer	60.42	49.59	72.37	82.73	72.93	91.59
El Leri	62.37	52.51	70.98	70.18	59.30	78.84
Abu Karshola	70.54	57.12	82.31	82.12	71.58	91.11
Delami	60.29	48.53	72.10	85.00	76.38	92.75
South Kordofan State	56.68	44.47	68.90	79.52	69.98	89.07
Abu Zabad	74.70	64.96	82.73	77.22	64.95	84.79
ElKhiwai	70.00	58.91	78.95	59.76	48.08	70.66
Ghubaish	47.63	28.69	62.21	58.70	42.72	73.38
El Nuhud	42.14	27.71	58.83	52.03	39.44	65.20
El Idia	41.13	26.12	56.89	53.70	42.77	65.96
Wad Benda	23.59	16.08	33.35	54.31	37.49	70.06
Lagawa	57.00	48.75	65.78	66.04	54.38	79.19
Elsunut	80.05	70.78	89.27	75.32	60.30	88.56
Keilik	70.92	63.51	76.58	83.87	72.28	90.86
Es Salam	81.64	74.36	88.25	79.60	71.81	85.76
Babanusa	20.33	13.14	29.86	65.90	56.94	75.02
Abyei	59.09	45.64	70.56	57.99	47.07	72.14
El Dibab	69.80	56.49	84.78	68.29	48.47	88.58
El Meiram	79.39	63.47	88.53	56.36	34.60	77.09

TABLE 82: Access to EPI services by locality and by state

Location	Vaccine card available / seen for children below 24 months			BCG coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
West Kordofan State	53.82	41.54	66.10	62.32	48.72	75.93
El Fasher	72.90	66.73	78.35	83.23	77.85	87.56
Tawila	52.15	34.75	68.72	79.82	62.05	92.87
Melit	47.71	36.17	57.50	66.67	54.61	78.81
Um Kadada	84.70	73.49	92.82	79.87	68.25	89.48
Kebkabiya	78.64	68.65	87.43	79.23	68.42	89.28
Kutum	45.85	36.07	57.91	68.82	55.38	78.42
El Mahalha	20.44	9.96	33.35	53.79	34.26	69.95
Saraf Omra	31.75	20.65	44.02	49.69	34.88	65.05
El Serief	14.92	10.49	20.64	53.26	40.95	61.37
Dar Elsalam	77.61	69.84	85.44	76.99	67.57	86.24
Kelemando	61.60	48.36	73.22	80.00	64.95	89.38
El Tawisha	37.30	29.62	44.98	42.51	33.33	51.15
Um Baru	33.18	23.33	49.23	52.08	32.49	68.22
El Lait	54.15	42.07	66.16	85.00	75.45	93.74
ELkuma	71.11	47.24	85.71	68.29	24.04	94.13
El Tina	0.00	0.00	0.00	100.00	100.00	100.00
Kernoi	55.43	46.75	65.89	78.97	64.11	91.84
North Darfur State	52.02	42.17	61.86	70.43	57.20	83.66
Nyala South	62.74	52.91	71.24	72.76	64.47	80.85
Nyala North	62.65	50.43	78.70	83.33	63.40	97.44
Es Salam	77.69	68.24	85.12	72.25	60.09	83.00
El Wihda	39.17	30.09	49.14	84.62	75.21	91.84
Mershing	18.39	10.75	27.13	75.54	66.00	84.35
Beliel	79.50	71.51	85.09	84.58	79.40	88.89
Nitega	14.29	4.90	25.87	82.71	70.54	94.69
Sharg El Jabal (accessible parts)	57.14	14.29	85.71	25.00	0.00	75.00
Kas	35.75	25.38	46.80	66.48	48.37	82.57
Shattaya	32.51	20.19	47.15	56.50	37.63	75.06
Buram	20.45	14.99	27.35	54.76	42.64	66.53
Gereida	53.79	44.02	63.47	82.63	72.54	89.89
El Sunta	8.24	3.55	12.81	52.29	38.42	64.58
El Radoum	22.22	9.07	37.66	33.66	21.14	48.44
Tulus	42.07	18.45	60.41	70.42	44.15	85.50
Damso	40.59	22.00	60.22	68.22	52.57	81.25

TABLE 82: Access to EPI services by locality and by state

Location	Vaccine card available / seen for children below 24 months			BCG coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ed Elfursan	59.40	47.18	71.07	63.71	46.09	78.65
Kubum	73.26	63.96	80.35	70.82	59.39	79.81
Kateila	55.99	43.98	67.30	57.98	44.69	69.47
Rehaid Elbirdi	10.70	3.25	20.54	49.83	31.18	66.06
Um Dafoug	3.21	0.00	8.14	24.14	7.89	41.85
South Darfur State	43.75	31.61	55.90	66.00	51.22	80.77
Abu Jabra	55.99	44.64	69.69	69.49	56.27	82.72
Abu Karinka	82.61	72.93	89.53	85.08	74.79	91.94
Bahr El Arab	14.23	7.68	21.92	28.35	16.14	42.53
Adila	68.51	57.36	79.48	60.10	44.44	73.89
Ed Dain	77.30	65.88	86.06	78.26	67.54	86.05
Assalaya	23.60	16.44	32.74	48.22	38.98	58.34
El Firdous	33.43	16.97	50.56	41.15	22.51	59.81
Shia-ria	41.31	26.72	58.93	87.05	78.54	95.59
Yassin	46.14	34.71	60.83	55.77	39.98	70.59
East Darfur State	48.77	37.42	60.12	59.94	46.92	72.95
El Geneina	48.46	39.61	59.50	70.26	63.10	76.97
Habila	16.49	8.10	26.95	51.87	36.35	66.55
Kulbus	44.15	33.12	56.09	69.15	55.73	80.85
Beida	39.71	24.87	54.46	68.67	56.72	80.48
Foro Baranga	40.84	32.85	48.86	50.61	34.58	62.22
Kereneik	66.31	57.54	73.45	91.94	84.71	96.42
Sirba	56.29	41.08	70.29	76.19	65.96	84.55
Jebel Moon	65.49	55.55	76.24	82.67	72.44	90.40
West Darfur State	49.13	38.44	59.82	71.87	62.12	81.61
Zalingi	72.78	63.39	82.26	84.34	76.40	91.04
Wadi Salih	34.59	20.17	49.89	52.20	35.23	67.91
Mukjar	22.97	6.30	44.39	29.61	14.14	49.69
Central Jebel Mara	16.16	4.90	29.37	78.72	62.21	93.06
North Jebel Mara	11.11	3.73	22.35	13.04	3.57	25.03
Bendasi	40.62	19.05	60.54	35.29	11.90	59.42
Nertiti	63.93	45.95	82.67	72.28	56.02	86.95
Azum	51.95	36.62	66.56	85.71	66.02	96.72
Um Dukhun	26.75	12.50	38.96	44.37	31.08	56.94
Central Darfur State	34.02	18.63	49.40	53.83	37.64	70.03

Spatial distribution of access to EPI services

There was an even spread of high BCG coverage across all of Sudan, with small areas of low coverage in the following places: South Darfur state; the southern area of Central Darfur state; the southern area of North Darfur state; the northern area of West Kordofan state; the Western area of North Kordofan state; and parts of Red Sea state *(see Figure 286)*.

FIGURE 284:
EPI: Vaccine card available / seen for children below 24 months (raster)

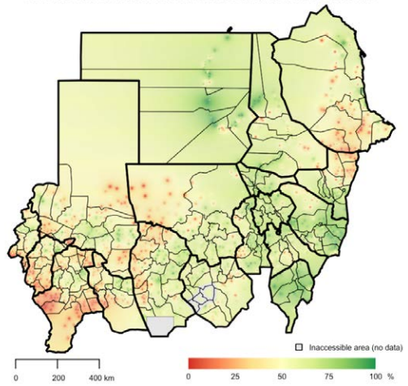


FIGURE 285:
EPI: Vaccine card available / seen for children below 24 months

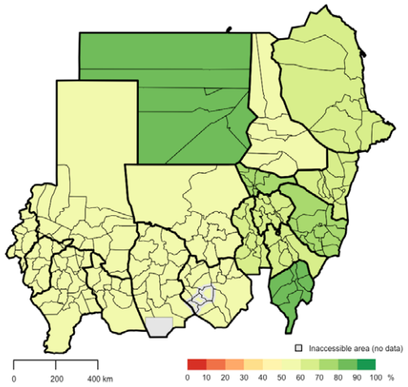


FIGURE 286:
EPI: BCG coverage for children below 12 months (raster)

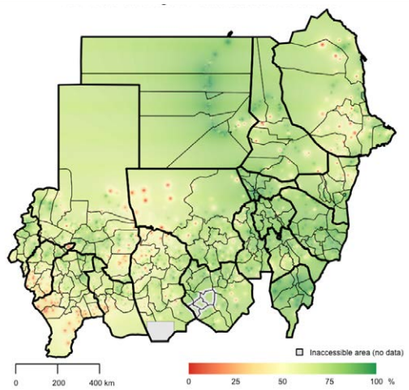
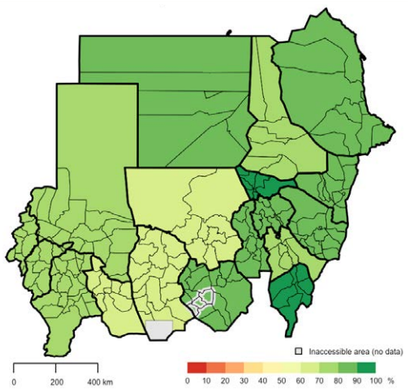


FIGURE 287:
EPI: BCG coverage for children below 12 months



3.14.2 Pentavalent vaccine coverage

A pentavalent vaccine, also known as 5-in-1 vaccine, is a combination vaccine with five individual vaccines conjugated into one and is intended to actively protect people from multiple diseases. In Sudan, the pentavalent vaccine is composed of a vaccine that protects children against diseases such as diphtheria, pertusis, tetanus, septicemia, hepatitis B and pneumonia. It replaces the traditional trivalent (DPT) vaccine; however, the schedules of 6, 10 and 14 weeks for immunization remain the same.

Pentavalent vaccine coverage average results

Coverage of the first dose of the pentavalent vaccine for children younger than 12 months old was 76 per cent (95 per cent CI 65.3-86.7 per cent). Coverage of the third dose of the pentavalent vaccine for the same group was 59 per cent (95 per cent CI 47.2-70.8 per cent). This is equivalent to a drop-out rate of 16.94 per cent. Khartoum state had the highest coverage of both the first dose and the third dose of the pentavalent vaccine, while Central Darfur state had the lowest coverage for the first dose and the third dose of this vaccine *(see Figure 288)*. Only 43.2 per cent of localities had at least 80 per cent of children younger than 12 months who received the first dose of the pentavalent vaccination, while only 3.8 per cent of localities had at least 80 per cent of children younger than 12 months who received the third dose *(see Figure 288)*.

Table 83 and Table 84 present per locality, per state and national level results of children under 12 months who received the first dose and third dose of the pentavalent vaccination.

FIGURE 288: Box plot of state and locality results for pentavalent vaccine coverage

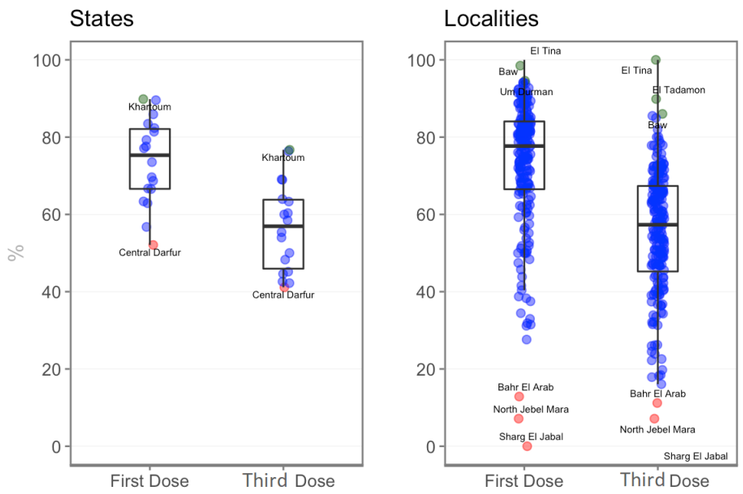


TABLE 83: Pentavalent vaccine coverage by state and national

State	First Dose Pentavalent Vaccine Coverage for Children below 12 months			Third Dose Pentavalent Vaccine Coverage for Children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	81.40	71.95	90.84	63.97	52.64	75.31
Al-Gazeera	83.45	74.99	91.91	63.30	51.70	74.90
Blue Nile	89.59	82.36	96.81	76.39	67.91	84.86

TABLE 83: Pentavalent vaccine coverage by state and national

State	First Dose Pentavalent Vaccine Coverage for Children below 12 months			Third Dose Pentavalent Vaccine Coverage for Children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Central Darfur	52.08	36.90	67.27	41.13	25.99	56.27
East Darfur	56.77	44.27	69.27	42.22	30.57	53.86
Kassala	77.60	69.01	86.19	60.01	49.95	70.07
Khartoum	89.83	82.91	96.75	76.72	66.79	86.65
North Darfur	68.69	55.63	81.75	54.01	40.95	67.08
North Kordofan	66.70	55.79	77.60	44.62	33.86	55.38
Northern	85.90	74.91	96.89	69.09	56.49	81.69
Red Sea	66.58	52.22	80.94	50.03	35.84	64.22
River Nile	73.52	63.73	83.32	60.37	49.27	71.47
Sennar	77.12	67.93	86.32	58.47	47.63	69.32
South Darfur	62.89	47.54	78.24	42.61	28.24	56.97
South Kordofan	79.27	69.81	88.72	55.40	42.29	68.50
West Darfur	69.64	58.89	80.39	48.29	37.37	59.20
West Kordofan	63.35	49.45	77.25	45.17	31.25	59.09
White Nile	82.34	73.37	91.31	68.94	58.06	79.82
Sudan	75.99	65.26	86.71	59.04	47.24	70.84

TABLE 84: Pentavalent vaccine coverage by locality and by state

Location	First Dose Pentavalent Vaccine Coverage for Children below 12 months			Third Dose Pentavalent Vaccine Coverage for Children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	87.96	79.58	95.05	66.53	55.79	76.80
El Golid	83.52	73.21	92.19	76.17	64.96	85.81
Merwoe	75.00	57.13	89.25	57.78	36.35	73.76
El Daba	92.56	84.66	98.44	76.70	68.67	84.38
Halfa	87.43	80.82	92.78	67.66	59.03	75.01
Delgo	90.34	81.86	96.25	83.09	73.15	90.48
El Burgaig	88.79	76.26	96.53	70.97	56.44	84.84
Northern State	85.90	74.91	96.89	69.09	56.49	81.69
El Matama	78.67	69.72	88.82	58.56	45.91	73.34
Shendi	71.60	59.39	81.58	53.74	41.79	64.55
Abu Hamad	81.29	71.99	89.04	74.27	63.16	82.37
Barbar	76.11	64.10	85.49	62.81	47.89	75.00

TABLE 84: Pentavalent vaccine coverage by locality and by state

Location	First Dose Pentavalent Vaccine Coverage for Children below 12 months			Third Dose Pentavalent Vaccine Coverage for Children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Damar	65.44	56.12	73.87	57.21	46.17	66.51
Atbara	75.94	66.47	85.00	66.34	56.54	74.40
El Buhaira	84.28	76.66	90.43	66.58	59.52	73.35
River Nile State	73.52	63.73	83.32	60.37	49.27	71.47
Khartoum	91.08	84.46	97.12	79.56	71.33	87.77
Bahri	87.50	77.71	93.80	78.86	66.66	88.55
Um Durman	94.48	88.76	98.58	82.00	71.65	89.93
Um Bada	90.16	83.74	95.12	76.09	66.66	84.63
Jebel Awlia	88.70	79.82	96.67	74.04	62.41	84.62
Sharg Elneel	91.37	84.17	96.64	77.37	66.19	85.97
Karrari	86.88	79.78	92.94	72.78	61.67	82.46
Khartoum State	89.83	82.91	96.75	76.72	66.79	86.65
Greater Medani	81.37	72.37	88.84	65.55	54.43	74.72
Ganub Elgazira	81.65	71.27	89.23	55.83	42.31	69.80
El Hassahisa	83.15	75.86	90.86	63.79	51.75	74.35
El Kamlin	77.63	68.75	85.90	58.67	48.22	69.55
Sharg El Gezira	81.19	69.29	88.89	61.08	49.52	72.41
Um Elqura	83.54	73.64	91.20	56.94	46.17	68.23
El Manaqil	90.07	81.53	95.87	69.41	57.20	80.77
El Qurashi	82.72	72.39	90.08	66.67	56.57	76.72
Al-Gazeera State	83.45	74.99	91.91	63.30	51.70	74.90
Sennar	85.14	78.26	91.13	66.55	57.91	74.86
Sharg Sennar	84.58	75.83	90.87	64.71	52.38	74.21
Sinja	90.94	84.18	96.26	71.15	62.68	79.56
Abu Hujar	52.73	41.61	63.77	34.43	22.78	47.31
El Dali	63.55	49.78	75.99	42.36	27.98	54.00
Es Suki	75.74	62.78	84.92	59.36	46.31	71.67
Ed Dinder	67.94	55.70	80.73	52.15	38.88	65.16
Sennar State	77.12	67.93	86.32	58.47	47.63	69.32
Ed Damazine	87.04	81.39	91.64	72.80	65.35	79.14
El Tadamon	91.49	86.85	95.24	90.09	85.17	94.34
El Roseiris	88.86	84.06	92.79	75.39	69.15	82.53
Baw	97.79	92.24	100.00	83.45	69.03	94.05
Geisan	82.81	74.30	90.52	66.67	55.42	74.71
El Kurmuk	88.43	74.10	98.19	70.87	53.98	86.21
Wad El Mahi	90.95	82.70	96.82	80.51	71.50	87.57
Blue Nile State	89.59	82.36	96.81	76.39	67.91	84.86

TABLE 84: Pentavalent vaccine coverage by locality and by state

Location	First Dose Pentavalent Vaccine Coverage for Children below 12 months			Third Dose Pentavalent Vaccine Coverage for Children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kosti	81.67	74.76	88.84	68.98	59.67	77.16
Guli	78.69	65.39	88.27	61.31	49.42	72.89
Tendalti	78.72	61.13	90.58	49.22	36.39	61.36
Es Salam	65.56	52.32	77.56	53.47	40.94	65.84
Rabak	84.06	77.65	90.23	67.08	59.17	75.29
El Jabalain	86.67	79.27	94.51	75.14	66.82	83.85
El Diwaim	82.43	69.71	90.84	70.95	57.89	80.79
Um Rimta	71.18	58.06	82.21	63.74	52.33	75.30
El Gitaina	95.00	85.71	100.00	88.54	73.77	98.59
White Nile State	82.34	73.37	91.31	68.94	58.06	79.82
Port Sudan	84.69	73.81	92.31	66.27	56.43	76.32
Swakin	88.46	76.74	97.13	69.54	51.67	80.87
El Gonob Welawlaib	60.00	43.22	72.95	46.51	32.86	59.65
Sinkat	62.73	45.67	78.71	57.89	40.23	75.30
Haya	29.85	16.64	44.65	23.68	9.83	39.09
Dordieb	56.56	42.53	66.52	39.75	26.92	52.78
Tokar	89.29	81.95	93.93	61.24	52.93	68.97
Agig	81.16	64.43	91.23	70.00	52.35	83.48
Gabaot Elma-aadin	76.92	61.17	86.90	56.18	41.30	69.67
Halaeeb (accessible parts)	85.29	33.33	98.78	45.00	18.11	63.27
Red Sea State	66.58	52.22	80.94	50.03	35.84	64.22
Kassala Town	94.12	86.04	99.39	72.33	62.40	80.63
Refi Kassla	86.64	80.13	92.74	67.95	58.43	78.61
Rural Western Kassala	78.04	69.61	86.77	50.87	39.82	61.30
New Halfa	82.19	74.99	88.48	63.10	54.12	71.33
Refi Nahr Atbara	83.66	75.66	90.70	53.62	44.50	62.08
Rural Khashm Elgirba	82.91	77.16	88.78	64.77	57.88	72.50
Rural Wad Elhilaiw	80.08	71.70	87.60	64.10	51.59	75.16
Rural Aroma	64.18	49.91	77.64	52.49	39.24	64.72
Refi North Delta	58.29	41.97	72.56	42.05	30.06	52.15
Refi Hamashkureib	86.73	79.34	93.53	76.26	65.31	85.60
Rural Telkok	47.85	35.51	57.24	36.53	25.34	46.10
Kassala State	77.60	69.01	86.19	60.01	49.95	70.07
Gedaref Town	75.76	63.61	85.01	59.89	48.07	69.68
Middle Geddaref	93.33	85.86	98.35	69.51	56.88	81.82
Elbutana	76.27	62.60	85.28	52.58	40.68	63.52
El Fashaga	84.15	72.99	92.87	73.26	62.50	84.05

TABLE 84: Pentavalent vaccine coverage by locality and by state

Location	First Dose Pentavalent Vaccine Coverage for Children below 12 months			Third Dose Pentavalent Vaccine Coverage for Children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Rahad	69.34	58.70	78.07	47.09	38.44	56.90
Gala-a El Nahal	87.91	76.17	97.34	73.20	62.50	85.19
El Fao	83.26	74.24	90.37	61.30	48.63	70.81
El Qureisha	86.83	78.94	94.22	75.98	67.34	84.22
El Mafaza	80.13	69.17	89.77	68.33	54.25	81.93
Basunda	79.65	71.57	86.67	60.73	50.29	71.11
Western Galabat	86.57	78.04	94.35	71.06	57.64	84.99
Eastern Galabat	90.11	84.18	95.37	74.37	63.39	84.28
Al-Gadarif State	81.40	71.95	90.84	63.97	52.64	75.31
Sheikan	78.11	71.58	83.83	54.66	47.52	61.25
Um Rawaba	65.01	55.84	73.65	45.28	36.55	54.45
Um Dam Haj Ahmed	78.16	70.25	86.13	57.61	46.53	66.67
El Rahad	75.17	61.26	86.41	57.25	40.28	71.09
Bara	63.06	51.48	73.24	31.18	19.28	42.58
Gharb Bara	61.75	47.53	73.80	32.31	20.57	45.99
Soudari	37.11	23.28	50.88	20.15	10.74	31.80
Gebrat El Sheikh	73.49	61.22	83.45	53.16	39.82	63.57
North Kordofan State	66.70	55.79	77.60	44.62	33.86	55.38
Kadugli	85.45	76.61	91.41	62.42	53.65	72.17
Reif Shargi	81.17	70.55	89.87	59.15	47.99	70.89
Dilling	80.14	69.99	88.84	51.82	37.72	67.23
El Quoz	80.18	71.14	87.63	58.82	49.99	68.71
Habila	85.64	78.75	91.31	69.01	56.91	79.16
Abassiya	84.23	76.44	90.46	62.50	51.87	73.82
El Rashad	85.47	77.21	91.92	56.07	45.22	69.55
Abu Jubaiha	72.60	61.24	81.99	50.61	40.18	60.69
El Tadamon	64.04	50.21	76.77	43.75	28.55	58.37
Talodi	90.48	79.03	98.28	51.92	36.34	75.02
Ghadeer	82.44	71.09	90.77	45.52	19.77	70.80
El Leri	71.01	61.57	80.21	50.00	41.32	60.94
Abu Karshola	81.35	70.57	90.15	57.71	47.70	67.49
Delami	80.00	68.74	90.12	60.44	44.81	72.45
South Kordofan State	79.27	69.81	88.72	55.40	42.29	68.50
Abu Zabad	71.91	62.61	80.87	55.62	44.44	66.90
ElKhiwai	56.90	44.69	68.05	43.14	33.33	55.32
Ghubaish	58.86	44.44	73.76	35.71	22.10	52.03
El Nuhud	50.83	38.42	65.70	32.33	20.91	43.90
El Idia	52.02	39.34	64.16	40.20	28.65	53.02

TABLE 84: Pentavalent vaccine coverage by locality and by state

Location	First Dose Pentavalent Vaccine Coverage for Children below 12 months			Third Dose Pentavalent Vaccine Coverage for Children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Wad Benda	58.37	42.98	74.70	38.31	25.09	53.92
Lagawa	66.67	54.73	78.88	46.67	33.61	59.36
Elsunut	74.88	60.27	89.40	63.16	49.36	77.20
Keilik	83.54	73.29	91.03	68.26	55.41	77.25
Es Salam	75.47	68.21	82.70	60.88	51.55	69.11
Babanusa	63.54	55.45	72.78	44.79	37.02	54.80
Abyei	74.55	61.90	85.29	51.43	39.86	64.56
El Dibab	70.00	50.88	87.31	58.73	38.18	77.81
El Meiram	72.92	50.00	90.01	42.86	26.07	60.76
West Kordofan State	63.35	49.45	77.25	45.17	31.25	59.09
El Fasher	80.72	75.04	85.10	66.48	60.23	72.13
Tawila	76.19	59.49	90.56	67.33	50.88	80.98
Melit	57.81	44.55	70.90	46.70	35.38	57.99
Um Kadada	77.37	63.73	89.29	62.13	51.83	74.46
Kebkabiya	80.45	66.89	90.00	78.06	66.48	89.05
Kutum	68.28	56.48	79.57	55.41	45.11	65.93
El Mahalha	54.73	35.46	68.06	47.79	28.46	65.81
Saraf Omra	48.37	32.92	64.34	32.84	19.28	50.07
El Serief	48.60	38.36	58.40	17.58	11.79	23.57
Dar Elsalam	72.65	62.29	82.74	52.67	40.86	64.44
Kelemando	77.60	65.53	87.70	61.70	48.40	73.84
El Tawisha	37.85	28.56	46.41	23.62	14.69	32.24
Um Baru	49.35	32.47	66.13	21.18	9.99	34.39
El Lait	83.33	71.51	93.10	74.31	62.99	85.15
ELkuma	68.29	26.85	93.11	67.37	27.16	90.01
El Tina	100.00	100.00	100.00	100.00	100.00	100.00
Kernoi	82.91	69.12	92.89	41.84	28.88	56.34
North Darfur State	68.69	55.63	81.75	54.01	40.95	67.08
Nyala South	71.74	63.18	80.63	51.11	40.48	61.24
Nyala North	75.86	52.92	92.02	45.00	26.49	66.67
Es Salam	72.73	62.07	83.11	51.64	41.55	61.54
El Wihda	84.21	76.12	91.28	73.27	61.45	82.93
Mershing	70.74	58.88	79.31	59.30	45.06	68.73
Beliel	72.26	66.58	78.37	51.01	43.68	57.97
Nitega	80.82	67.08	93.24	48.98	36.29	65.09
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00
Kas	61.72	44.82	78.88	35.29	21.63	50.84

TABLE 84: Pentavalent vaccine coverage by locality and by state

Location	First Dose Pentavalent Vaccine Coverage for Children below 12 months			Third Dose Pentavalent Vaccine Coverage for Children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Shattaya	60.00	41.75	78.33	29.47	13.90	45.29
Buram	49.53	35.55	63.30	33.66	21.67	44.93
Gereida	79.37	70.41	86.98	72.83	62.27	82.69
El Sunta	47.27	32.32	60.75	32.95	20.10	45.84
El Radoum	32.42	18.83	48.22	16.28	6.25	26.91
Tulus	70.89	43.19	86.68	47.62	25.00	69.71
Damso	64.89	51.49	78.36	42.86	28.84	59.27
Ed Elfursan	58.97	39.21	76.48	40.00	23.47	57.86
Kubum	68.38	51.99	78.99	50.54	36.44	60.72
Kateila	49.60	38.94	64.10	31.71	21.96	43.60
Rehaid Elbirdi	50.90	32.69	65.67	38.69	25.27	51.34
Um Dafoug	26.25	8.63	46.56	17.61	5.98	30.62
South Darfur State	62.89	47.54	78.24	42.61	28.24	56.97
Abu Jabra	73.74	58.32	84.85	40.67	24.26	57.00
Abu Karinka	82.05	72.72	89.08	65.19	52.40	75.79
Bahr El Arab	12.82	5.15	21.28	11.63	4.44	19.74
Adila	62.43	46.33	77.35	53.06	37.50	68.64
Ed Dain	76.10	66.31	85.13	58.76	49.07	67.70
Assalaya	48.88	38.88	58.53	32.16	23.91	40.44
El Firdous	40.78	23.02	59.30	23.04	11.60	37.28
Shia-ria	86.57	77.05	95.14	71.85	59.99	83.68
Yassin	56.78	39.33	72.34	36.73	26.04	46.23
East Darfur State	56.77	44.27	69.27	42.22	30.57	53.86
El Geneina	70.08	63.19	76.97	47.77	39.93	55.62
Habila	50.53	33.13	65.95	36.36	21.21	48.80
Kulbus	65.95	53.70	79.39	43.86	31.87	58.13
Beida	68.11	56.04	79.26	60.13	48.33	71.79
Foro Baranga	49.03	35.92	62.59	35.53	23.32	46.94
Kereneik	86.34	79.49	91.48	46.32	38.66	53.77
Sirba	76.22	66.84	85.24	55.66	46.10	64.23
Jebel Moon	76.30	62.54	87.46	59.06	44.43	71.66
West Darfur State	69.64	58.89	80.39	48.29	37.37	59.20
Zalingi	80.09	70.61	87.21	57.14	49.86	64.42
Wadi Salih	51.72	33.51	66.88	49.70	35.18	63.25
Mukjar	31.65	18.35	47.58	26.39	10.07	44.49
Central Jebel Mara	78.18	60.91	90.33	63.79	45.22	80.96
North Jebel Mara	12.50	1.63	28.26	12.50	1.67	29.45
Bendasi	34.55	14.11	55.88	33.94	13.38	55.06

TABLE 84: Pentavalent vaccine coverage by locality and by state

Location	First Dose Pentavalent Vaccine Coverage for Children below 12 months			Third Dose Pentavalent Vaccine Coverage for Children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nertiti	75.00	60.00	86.49	59.88	39.50	77.49
Azum	77.57	60.32	88.57	31.36	17.79	45.16
Um Dukhun	41.43	31.05	54.44	35.77	24.01	50.33
Central Darfur State	52.08	36.90	67.27	41.13	25.99	56.27

Spatial distribution of pentavalent vaccine coverage

FIGURE 289:
EPI: First dose pentavalent vaccine coverage for children below 12 months (raster)

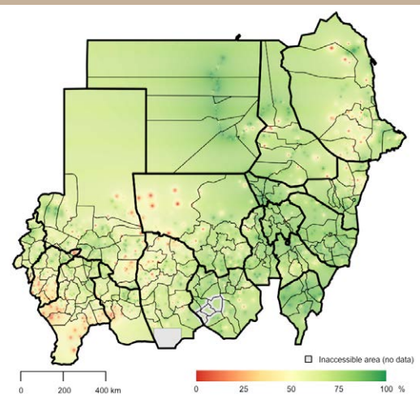


FIGURE 290:
EPI: First dose pentavalent vaccine coverage for children below 12 months

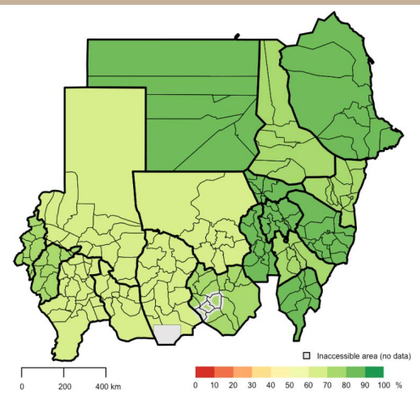


FIGURE 291:
EPI: Third dose pentavalent vaccine coverage for children below 12 months (raster)

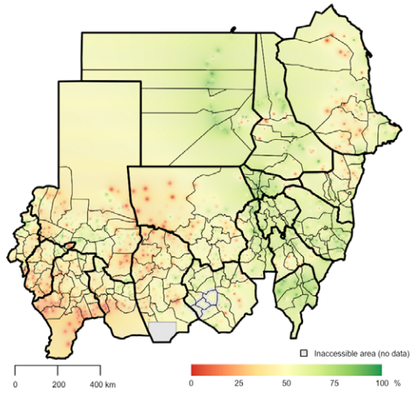
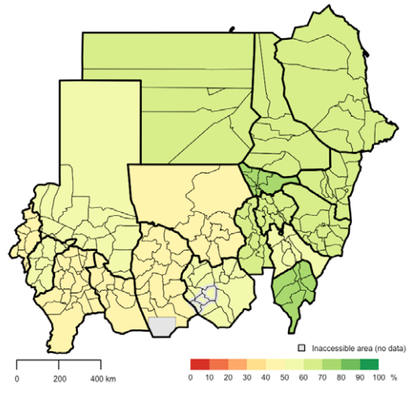


FIGURE 292:
EPI: Third dose pentavalent vaccine coverage for children below 12 months



3.14.3 Oral polio vaccine (OPV) coverage

OPV coverage average results

Coverage of the first dose of the oral polio vaccine for children younger than 12 months old was 72.7 per cent (95 per cent CI 61.7-83.6 per cent) across Sudan. Coverage of the third dose of the oral polio vaccine for children younger than 12 months old was 56.9 per cent (95 per cent CI 45.2-68.5 percent). This is equivalent to a drop-out rate of 15.8 per cent.

Blue Nile state had the highest coverage of the first dose of the oral polio vaccine, while Khartoum state had the highest coverage of the third dose of the oral polio vaccine. Central Darfur state had the lowest coverage of the first and the third dose of this vaccine *(see Figure 293)*. Only 31.4 per cent of localities had 80 per cent or more of children younger than 12 months who received the first dose of the oral polio vaccination, while a mere 2.7 per cent of localities had 80 per cent or more of children younger than 12 months who received the third dose of the oral polio vaccination *(see Figure 293)*.

Table 85 and Table 86 present per locality, per state and national level results for coverage of children under 12 months with the first and the third dose of the oral polio vaccination.

FIGURE 293: Box plot of state and locality results for OPV coverage

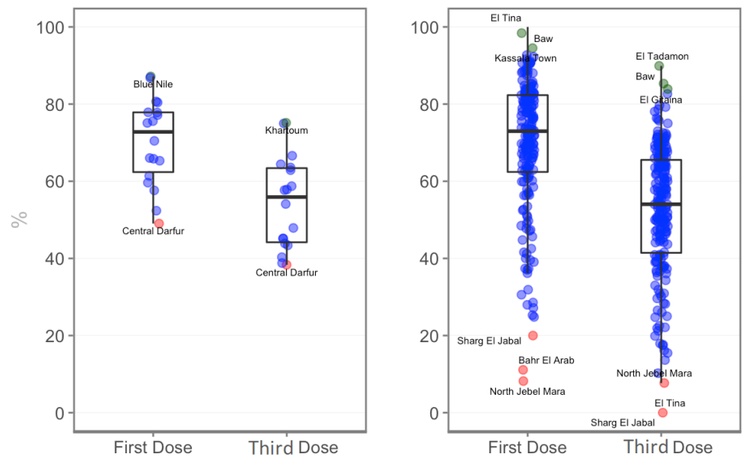


TABLE 85: OPV coverage by state and national

State	EPI: First dose OPV coverage for children below 12 months			EPI: Third dose OPV coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	77.87	68.39	87.35	63.57	52.32	74.83
Al-Gazeera	80.68	71.84	89.52	62.88	52.14	73.63
Blue Nile	87.17	79.47	94.86	74.99	66.26	83.72

TABLE 85: OPV coverage by state and national

State	EPI: First dose OPV coverage for children below 12 months			EPI: Third dose OPV coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Central Darfur	49.03	34.27	63.79	38.34	23.70	52.98
East Darfur	52.36	39.68	65.04	38.78	27.40	50.16
Kassala	77.15	68.22	86.07	58.72	48.32	69.12
Khartoum	86.84	78.84	94.84	75.15	65.25	85.06
North Darfur	66.01	52.77	79.25	47.89	34.96	60.81
North Kordofan	65.31	54.70	75.92	43.86	33.51	54.21
Northern	80.42	68.42	92.43	66.61	54.07	79.15
Red Sea	61.39	47.26	75.52	45.16	31.28	59.05
River Nile	70.47	60.56	80.39	57.85	45.79	69.91
Sennar	75.58	66.08	85.08	57.70	46.72	68.69
South Darfur	57.63	42.84	72.42	40.32	26.07	54.56
South Kordofan	77.82	67.41	88.23	54.10	41.31	66.88
West Darfur	65.82	54.62	77.01	45.15	33.89	56.42
West Kordofan	59.63	45.95	73.30	43.39	29.74	57.05
White Nile	75.11	64.93	85.30	64.40	53.37	75.44
Sudan	72.66	61.72	83.61	56.88	45.23	68.54

TABLE 86: OPV coverage by locality and by state

Location	EPI: First dose OPV coverage for children below 12 months			EPI: Third dose OPV coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	88.42	78.98	95.12	64.57	54.05	75.00
El Golid	72.39	58.82	83.46	67.66	55.56	77.32
Merwoe	75.00	58.82	90.12	55.43	37.96	70.50
El Daba	82.89	72.96	91.90	75.63	67.50	83.83
Halfa	86.89	80.62	92.23	68.39	58.96	76.51
Delgo	86.72	78.08	93.67	80.37	72.26	88.11
El Burgaig	72.03	58.40	85.02	64.60	49.98	79.38
Northern State	80.42	68.42	92.43	66.61	54.07	79.15
El Matama	77.22	67.06	85.99	58.16	45.06	71.70
Shendi	69.51	58.54	80.54	51.49	38.22	63.41
Abu Hamad	80.77	72.14	88.78	74.59	63.97	82.84
Barbar	73.02	57.71	84.86	58.41	43.47	70.02
El Damar	64.67	54.77	73.72	56.33	45.97	65.83
Atbara	62.86	52.08	72.60	57.96	47.79	67.18

TABLE 86: OPV coverage by locality and by state

Location	EPI: First dose OPV coverage for children below 12 months			EPI: Third dose OPV coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Buhaira	80.73	72.11	87.46	64.81	57.42	71.22
River Nile State	70.47	60.56	80.39	57.85	45.79	69.91
Khartoum	89.89	80.28	96.22	78.87	70.53	87.19
Bahri	84.66	74.44	92.45	78.17	67.38	88.77
Um Durman	88.39	79.82	96.19	78.98	68.60	88.11
Um Bada	90.12	83.77	95.12	75.77	66.95	84.31
Jebel Awlia	81.20	67.74	90.53	70.87	58.95	82.53
Sharg Elneel	89.81	82.79	96.34	75.66	65.43	84.42
Karrari	83.83	78.06	90.13	70.11	59.42	80.73
Khartoum State	86.84	78.84	94.84	75.15	65.25	85.06
Greater Medani	78.02	69.53	85.47	64.05	50.24	74.01
Ganub Elgazira	82.56	72.11	90.75	56.89	43.50	68.80
El Hassahisa	81.86	74.59	89.04	62.50	53.96	73.20
El Kamlin	75.15	65.17	84.53	57.61	48.27	67.21
Sharg El Gezira	82.01	71.84	90.42	60.09	49.76	70.59
Um Elqura	79.25	69.50	87.37	58.97	48.60	69.32
El Manaqil	82.29	73.59	89.54	69.43	57.36	81.82
El Qurashi	80.32	69.93	89.31	66.84	56.40	77.22
Al-Gazeera State	80.68	71.84	89.52	62.88	52.14	73.63
Sennar	84.72	77.70	90.42	66.90	58.13	74.29
Sharg Sennar	81.86	74.19	88.16	65.47	54.64	76.53
Sinja	90.23	83.46	95.66	69.96	61.22	77.37
Abu Hujar	46.64	36.07	59.84	31.67	22.01	43.40
El Dali	62.96	49.47	74.86	42.01	28.70	54.51
Es Suki	75.41	62.56	86.08	57.98	43.66	69.78
Ed Dinder	64.78	52.00	77.78	49.08	36.99	61.54
Sennar State	75.58	66.08	85.08	57.70	46.72	68.69
Ed Damazine	75.58	66.08	85.08	57.70	46.72	68.69
El Tadamon	91.52	87.18	95.68	90.04	84.89	94.42
El Roseiris	81.87	74.52	87.77	68.89	63.05	75.37
Baw	97.33	91.77	100.00	83.45	69.90	94.42
Geisan	83.64	76.24	91.06	67.74	59.53	76.87
El Kurmuk	82.98	68.59	93.62	70.37	52.93	82.93
Wad El Mahi	90.45	81.38	96.54	80.40	71.64	87.32
Blue Nile State	87.17	79.47	94.86	74.99	66.26	83.72
Kosti	68.46	60.48	77.46	63.51	55.13	73.22
Guli	69.40	54.63	80.56	57.41	41.94	71.85
Tendalti	72.38	56.14	84.24	44.35	32.16	57.03

TABLE 86: OPV coverage by locality and by state

Location	EPI: First dose OPV coverage for children below 12 months			EPI: Third dose OPV coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Es Salam	38.64	25.96	49.04	29.03	20.76	37.77
Rabak	79.20	71.30	85.78	62.40	53.27	70.89
El Jabalain	86.76	78.08	93.72	74.75	65.94	83.49
El Diwaim	79.75	67.11	89.88	69.33	56.21	80.70
Um Rimta	62.64	50.31	73.39	59.67	46.14	71.61
El Gitaina	93.06	80.44	100.00	87.50	73.91	97.19
White Nile State	75.11	64.93	85.30	64.40	53.37	75.44
Port Sudan	77.23	66.17	87.49	58.49	46.97	69.95
Swakin	59.75	45.24	74.69	57.24	43.10	70.64
El Gonob Welawlaib	62.96	45.50	78.87	45.99	31.08	61.11
Sinkat	57.71	41.43	73.94	53.23	37.90	71.67
Haya	26.09	14.99	37.71	13.95	4.80	24.53
Dordieb	57.14	40.55	67.77	40.00	27.38	52.63
Tokar	90.82	83.64	96.20	63.11	54.32	71.09
Agig	79.14	63.80	90.60	68.00	52.90	82.12
Gabaot Elma-aadin	67.62	51.18	83.07	50.00	31.67	65.72
Halaeeb (accessible parts)	75.00	37.47	89.50	40.00	19.94	58.35
Red Sea State	61.39	47.26	75.52	45.16	31.28	59.05
Kassala Town	94.44	87.15	99.04	70.43	61.67	78.41
Refi Kassla	83.53	77.44	90.64	62.25	52.15	71.50
Rural Western Kassala	76.19	67.77	84.55	50.00	40.49	60.11
New Halfa	82.61	76.14	88.65	61.96	53.02	71.75
Refi Nahr Atbara	83.10	74.75	89.90	54.26	44.93	62.26
Rural Khashm Elgirba	82.78	76.66	88.02	64.61	57.08	70.63
Rural Wad Elhilaiw	81.27	72.98	88.90	64.13	52.30	75.00
Rural Aroma	64.29	50.22	76.11	51.35	39.15	61.64
Refi North Delta	59.24	43.67	72.35	42.01	31.27	52.08
Refi Hamashkureib	84.68	76.18	92.72	72.55	61.11	83.57
Rural Telkok	47.52	36.05	57.42	36.24	26.39	47.75
Kassala State	77.15	68.22	86.07	58.72	48.32	69.12
Gedaref Town	68.42	57.80	76.94	58.41	46.18	69.74
Middle Geddaref	92.73	86.53	97.78	69.92	56.16	81.83
Elbutana	72.30	61.36	81.82	52.41	41.37	62.75
El Fashaga	84.28	73.55	93.94	73.47	62.09	84.22
El Rahad	64.26	54.52	74.02	45.59	36.74	55.80
Gala-a El Nahal	87.50	75.13	97.15	70.73	59.76	81.58
El Fao	78.65	69.36	85.98	62.82	52.73	72.59

TABLE 86: OPV coverage by locality and by state

Location	EPI: First dose OPV coverage for children below 12 months			EPI: Third dose OPV coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Qureisha	87.72	79.53	94.16	76.12	66.32	85.16
El Mafaza	82.32	69.39	91.87	68.28	53.25	81.89
Basunda	71.04	62.09	81.17	62.62	51.34	72.06
Western Galabat	85.99	76.61	93.16	71.84	57.90	84.90
Eastern Galabat	85.19	76.98	92.00	70.35	57.84	81.51
Al-Gadarif State	77.87	68.39	87.35	63.57	52.32	74.83
Sheikan	75.87	69.34	81.93	55.38	48.04	61.41
Um Rawaba	64.57	53.75	73.16	43.78	35.21	52.13
Um Dam Haj Ahmed	76.34	65.70	84.63	56.37	46.44	64.98
El Rahad	75.78	61.53	86.28	55.92	39.60	70.65
Bara	61.95	50.00	71.49	31.34	20.26	42.58
Gharb Bara	60.98	48.40	71.78	31.82	20.65	44.39
Soudari	33.33	20.91	47.17	20.21	9.59	31.38
Gebrat El Sheikh	71.37	59.87	83.05	50.22	37.25	60.65
North Kordofan State	65.31	54.70	75.92	43.86	33.51	54.21
Kadugli	78.75	69.28	86.88	60.27	51.64	71.12
Reif Shargi	79.62	68.09	90.21	56.44	47.02	66.91
Dilling	83.33	69.72	94.01	50.55	36.33	67.72
El Quoz	78.63	69.16	86.88	57.46	48.43	67.41
Habila	82.78	75.56	88.89	68.56	55.65	79.01
Abassiya	79.09	67.19	87.84	60.27	48.26	73.07
El Rashad	84.58	77.25	90.28	55.56	44.27	67.94
Abu Jubaiha	70.25	57.80	80.28	49.62	38.80	61.20
El Tadamon	60.10	47.47	74.44	41.50	22.84	57.09
Talodi	88.33	73.07	98.39	52.46	36.04	73.69
Ghadeer	82.18	71.30	91.75	46.51	25.81	70.25
El Leri	69.80	60.29	79.58	49.75	40.20	58.80
Abu Karshola	82.50	73.24	89.35	53.55	42.77	62.39
Delami	78.57	67.00	90.02	53.76	40.77	65.81
South Kordofan State	77.82	67.41	88.23	54.10	41.31	66.88
Abu Zabad	63.59	53.29	74.28	48.95	38.22	59.33
ElKhiwai	49.42	39.73	59.57	43.98	33.12	54.86
Ghubaish	55.08	39.69	71.14	33.85	18.08	50.78
El Nuhud	45.51	32.21	56.43	28.66	18.99	41.21
El Idia	50.78	39.99	62.62	40.74	29.32	54.68
Wad Benda	58.08	40.78	73.57	35.59	21.65	53.19
Lagawa	67.72	55.16	79.85	45.77	34.07	58.59
Elsunut	71.90	56.76	86.32	60.00	45.26	73.02

TABLE 86: OPV coverage by locality and by state

Location	EPI: First dose OPV coverage for children below 12 months			EPI: Third dose OPV coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Keilik	81.29	71.48	87.65	67.76	56.36	77.19
Es Salam	71.81	63.11	79.64	57.66	49.10	64.77
Babanusa	63.56	54.58	73.16	44.24	36.39	54.22
Abyei	73.10	59.99	84.19	52.87	40.66	65.49
El Dibab	68.12	49.25	86.90	56.10	36.15	75.36
El Meiram	65.12	39.45	79.59	44.68	22.67	63.83
West Kordofan State	59.63	45.95	73.30	43.39	29.74	57.05
El Fasher	78.08	72.86	83.00	63.62	58.29	69.77
Tawila	74.42	57.59	88.21	66.67	50.86	80.79
Melit	60.25	49.21	72.12	46.59	33.07	58.94
Um Kadada	67.65	55.80	79.96	57.70	45.85	68.88
Kebkabiya	81.38	67.65	91.68	76.98	64.85	89.59
Kutum	60.39	48.72	71.61	53.37	41.33	64.73
El Mahalha	55.62	38.26	72.06	47.59	27.80	66.94
Saraf Omra	43.06	27.42	62.61	25.42	11.84	43.00
El Serief	46.99	35.85	58.69	13.29	6.91	19.69
Dar Elsalam	73.55	63.55	82.06	56.67	44.82	67.77
Kelemando	74.49	61.48	83.59	59.59	46.29	69.90
El Tawisha	38.91	30.67	49.35	22.46	14.16	32.07
Um Baru	51.02	34.53	67.95	20.55	9.46	32.86
El Lait	71.79	60.11	83.10	70.00	59.08	79.70
ELkuma	59.68	26.58	88.46	55.32	19.97	81.25
El Tina	100.00	100.00	100.00	0.00	0.00	0.00
Kernoi	71.66	59.74	80.55	36.05	24.31	46.16
North Darfur State	66.01	52.77	79.25	47.89	34.96	60.81
Nyala South	62.61	54.03	70.91	43.81	34.06	54.41
Nyala North	66.67	49.93	81.48	37.50	20.00	56.53
Es Salam	67.71	57.26	79.04	47.35	37.15	58.62
El Wihda	81.10	70.00	89.50	72.63	61.23	81.18
Mershing	69.21	59.10	78.89	56.20	45.89	66.35
Beliel	70.77	64.72	76.28	50.37	43.29	57.00
Nitega	80.88	65.54	93.48	33.33	23.93	45.77
Sharg El Jabal (accessible parts)	25.00	0.00	66.67	0.00	0.00	0.00
Kas	62.71	45.67	79.16	35.98	22.22	48.40
Shattaya	60.85	41.95	76.52	29.67	14.59	45.61
Buram	53.55	40.66	64.99	36.06	23.89	47.33
Gereida	74.74	65.58	82.43	69.61	56.21	80.01
El Sunta	45.86	33.31	60.41	26.38	17.28	36.53

TABLE 86: OPV coverage by locality and by state

Location	EPI: First dose OPV coverage for children below 12 months			EPI: Third dose OPV coverage for children below 12 months		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Radoum	32.14	18.41	47.01	15.84	6.49	26.11
Tulus	68.29	45.64	85.71	48.94	23.80	73.19
Damso	63.21	47.28	77.99	47.37	30.08	65.82
Ed Elfursan	41.07	24.29	57.55	39.83	24.53	57.78
Kubum	60.31	46.32	70.40	49.32	34.37	60.13
Kateila	28.57	19.32	41.18	22.31	12.25	32.77
Rehaid Elbirdi	51.24	32.74	66.67	37.55	23.84	51.85
Um Dafoug	26.62	8.58	45.86	17.47	5.88	29.03
South Darfur State	57.63	42.84	72.42	40.32	26.07	54.56
Abu Jabra	65.73	51.82	76.51	37.04	22.28	51.73
Abu Karinka	65.08	48.89	77.59	54.66	40.43	65.99
Bahr El Arab	11.85	4.16	19.83	9.92	3.10	17.48
Adila	62.75	45.89	76.49	53.73	39.52	71.53
Ed Dain	75.70	65.42	85.03	56.81	47.13	68.87
Assalaya	51.74	41.17	61.55	29.96	22.76	38.86
El Firdous	33.74	15.04	50.57	21.17	8.64	34.61
Shia-ria	83.46	71.22	92.98	68.75	54.93	80.79
Yassin	50.22	33.96	65.66	31.13	20.34	42.55
East Darfur State	52.36	39.68	65.04	38.78	27.40	50.16
El Geneina	66.67	58.74	74.65	42.86	34.88	50.58
Habila	44.51	31.85	57.91	34.68	19.78	47.83
Kulbus	62.72	48.07	73.36	43.02	30.24	57.15
Beida	61.59	51.33	72.92	52.56	41.89	62.92
Foro Baranga	44.69	31.20	59.06	31.32	20.76	40.81
Kereneik	86.68	80.60	91.44	44.04	35.63	51.32
Sirba	73.47	62.37	82.66	52.94	44.54	61.35
Jebel Moon	71.84	55.61	83.34	60.47	43.42	74.91
West Darfur State	65.82	54.62	77.01	45.15	33.89	56.42
Zalingi	78.25	68.81	84.98	51.85	42.23	58.18
Wadi Salih	47.37	30.53	61.86	44.72	29.82	57.31
Mukjar	24.41	11.43	41.37	24.26	12.25	40.77
Central Jebel Mara	77.78	61.46	92.31	63.83	46.66	81.40
North Jebel Mara	11.67	0.00	26.94	9.09	0.00	23.14
Bendasi	33.66	12.50	54.65	34.65	12.88	55.25
Nertiti	73.06	55.02	87.60	59.17	39.01	75.95
Azum	72.99	55.78	83.59	33.65	22.10	45.00
Um Dukhun	35.61	23.28	48.63	29.01	18.75	39.27
Central Darfur State	49.03	34.27	63.79	38.34	23.70	52.98

Spatial distribution of OPV coverage

There was an even spatial spread of relatively high first-dose OPV coverage across Sudan, with pockets of low coverage in several places: South Darfur state; southern parts of Central Darfur state; parts of North and West Kordofan states; and parts of Red Sea state *(see Figure 294)*. For third dose of oral polio vaccine coverage, the pockets of low coverage from the first dose spread to include most of the Darfur states, as well as North and West Kordofan states *(see Figure 296)*.

FIGURE 294:
EPI: First dose OPV Coverage for children below 12 months (raster)

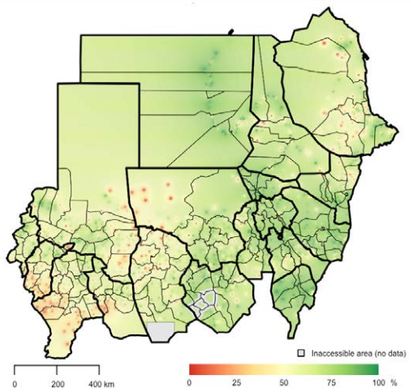


FIGURE 295:
EPI: First dose OPV coverage for children below 12 months

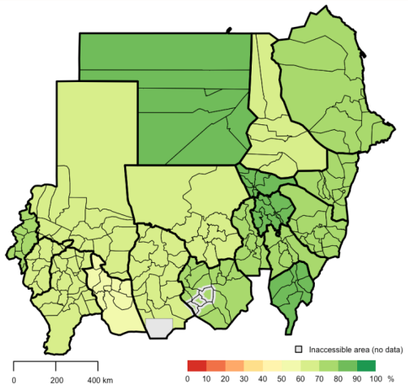


FIGURE 296:
EPI: Third dose OPV coverage for children below 12 months (raster)

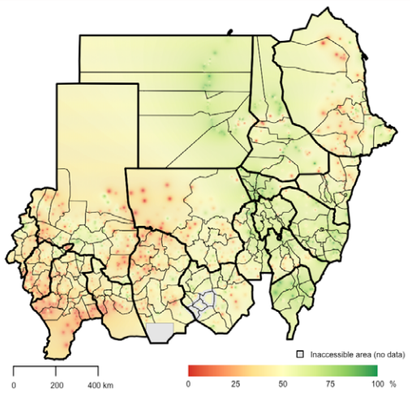
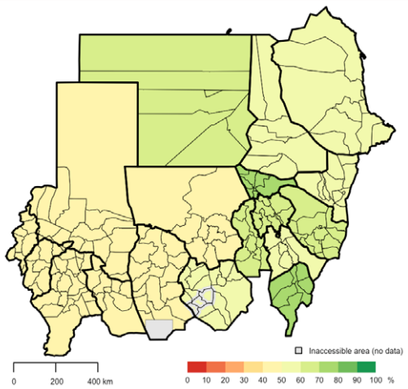


FIGURE 297:
EPI: Third dose OPV coverage for children below 12 months



3.14.4 Measles vaccine coverage

Measles vaccine coverage average results

First-dose measles vaccine coverage of children younger than 12 months old was 28.5 per cent (95 per cent CI 18.3-38.7 per cent) across Sudan. Khartoum state had the highest first-dose measles vaccine coverage and North Kordofan state had the lowest first-dose measles vaccine coverage *(see Figure 298)*. In no locality did at least 80 per cent of children younger than 12 months receive the first-dose measles vaccination *(see Figure 298)*.

Table 87 and Table 88 present per locality, per state and national level results for children under 12 months who received the first-dose measles vaccination.

FIGURE 298: Box plot of state and locality results for measles vaccine coverage

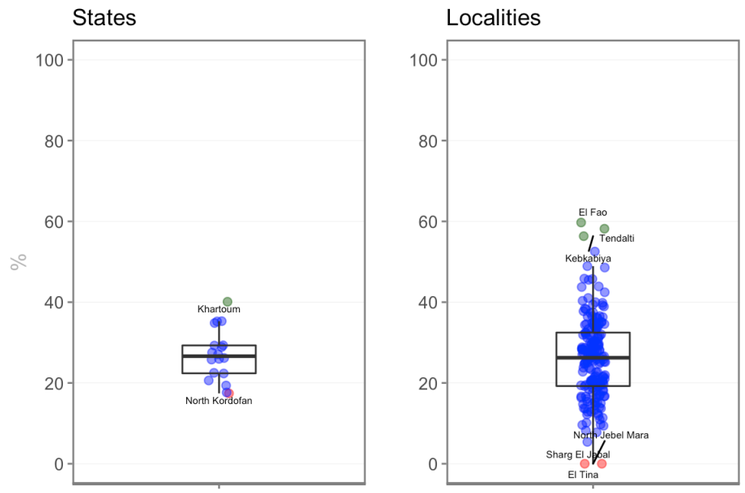


TABLE 87: Measles vaccine coverage by state and national

State	First dose measles vaccine for children below 12 months		
	Estimate	95% LCL	95% UCL
Al-Gadarif	34.85	23.96	45.74
Al-Gazeera	29.26	19.76	38.76
Blue Nile	35.28	25.22	45.34
Central Darfur	19.38	7.98	30.77
East Darfur	22.35	12.14	32.57
Kassala	25.78	17.58	33.98
Khartoum	40.09	29.25	50.94
North Darfur	26.18	16.45	35.91
North Kordofan	17.42	10.67	24.16
Northern	29.31	17.95	40.67
Red Sea	25.97	14.40	37.54
River Nile	27.07	17.68	36.47
Sennar	27.54	18.06	37.02
South Darfur	20.62	8.46	32.78
South Kordofan	22.51	13.40	31.62

TABLE 87: Measles vaccine coverage by state and national

State	First dose measles vaccine for children below 12 months		
	Estimate	95% LCL	95% UCL
West Darfur	28.90	18.36	39.43
West Kordofan	17.64	8.66	26.61
White Nile	35.24	23.65	46.84
Sudan	28.50	18.28	38.73

TABLE 88: Measles vaccine coverage by locality and state

Location	First dose measles vaccine for children below 12 months		
	Estimate	95% LCL	95% UCL
Dongola	26.50	17.47	35.95
El Golid	36.42	27.07	48.69
Merwoe	26.25	16.24	38.89
El Daba	27.82	18.27	39.17
Halfa	27.27	20.59	36.77
Delgo	37.13	27.92	46.84
El Burgaig	31.15	19.64	46.30
Northern State	29.31	17.95	40.67
El Matama	25.48	13.09	38.49
Shendi	19.37	12.11	27.89
Abu Hamad	36.07	26.37	47.28
Barbar	34.35	23.25	46.17
El Damar	26.95	20.37	34.80
Atbara	21.86	13.65	30.93
El Buhaira	40.06	31.26	49.10
River Nile State	27.07	17.68	36.47
Khartoum	47.88	34.98	61.38
Bahri	52.80	39.72	62.66
Um Durman	40.99	32.00	50.61
Um Bada	36.55	27.10	46.04
Jebel Awlia	38.39	25.21	51.52
Sharg Elneel	34.06	23.93	46.31
Karrari	39.71	30.40	48.97
Khartoum State	40.09	29.25	50.94

TABLE 88: Measles vaccine coverage by locality and state

Location	First dose measles vaccine for children below 12 months		
	Estimate	95% LCL	95% UCL
Greater Medani	28.42	20.35	37.71
Ganub Elgazira	29.23	20.50	40.89
El Hassahisa	29.69	20.88	38.34
El Kamlin	14.29	7.14	21.55
Sharg El Gezira	32.91	23.47	43.12
Um Elqura	26.62	15.10	38.10
El Manaqil	33.33	22.40	45.72
El Qurashi	31.79	24.36	39.35
Al-Gazeera State	29.26	19.76	38.76
Sennar	34.05	27.92	40.99
Sharg Sennar	31.05	20.60	42.86
Sinja	29.07	23.30	35.71
Abu Hujar	13.28	7.23	20.71
El Dali	20.94	10.87	32.05
Es Suki	29.34	18.22	40.86
Ed Dinder	22.39	12.94	32.52
Sennar State	27.54	18.06	37.02
Ed Damazine	29.81	20.77	39.68
El Tadamon	41.26	32.32	51.43
El Roseiris	38.69	31.08	46.83
Baw	34.27	25.37	42.97
Geisan	31.97	23.00	40.78
El Kurmuk	40.24	24.97	53.87
Wad El Mahi	32.47	22.33	43.89
Blue Nile State	35.28	25.22	45.34
Kosti	23.94	15.80	33.34
Guli	24.69	16.29	34.90
Tendalti	58.82	46.58	72.87
Es Salam	16.67	9.99	24.19
Rabak	35.34	27.55	43.35
El Jabalain	30.57	22.44	40.31
El Diwaim	34.57	25.49	43.92
Um Rimta	35.97	24.45	46.53
El Gitaina	56.57	37.37	75.44
White Nile State	35.24	23.65	46.84
Port Sudan	26.52	18.22	35.32

TABLE 88: Measles vaccine coverage by locality and state

Location	First dose measles vaccine for children below 12 months		
	Estimate	95% LCL	95% UCL
Swakin	25.34	15.36	37.83
El Gonob Welawlaib	31.85	18.44	44.72
Sinkat	39.47	24.65	55.89
Haya	8.51	2.17	21.20
Dordieb	30.90	19.03	42.33
Tokar	32.13	24.12	40.09
Agig	48.25	32.10	61.02
Gabaot Elma-aadin	27.05	10.39	42.40
Halaeeb (accessible parts)	24.00	8.70	44.49
Red Sea State	25.97	14.40	37.54
Kassala Town	32.40	23.56	41.38
Refi Kassla	33.33	24.83	42.28
Rural Western Kassala	24.23	16.74	31.13
New Halfa	22.96	16.31	31.52
Refi Nahr Atbara	31.22	21.92	40.22
Rural Khashm Elgirba	21.03	14.46	28.39
Rural Wad Elhilaiw	21.29	13.02	28.11
Rural Aroma	18.06	12.43	24.52
Refi North Delta	19.60	11.44	29.35
Refi Hamashkureib	27.27	20.77	34.50
Rural Telkok	20.55	12.75	30.00
Kassala State	25.78	17.58	33.98
Gedaref Town	25.13	14.61	36.36
Middle Geddaref	46.71	30.81	63.51
Elbutana	26.50	18.83	36.09
El Fashaga	34.27	21.15	47.77
El Rahad	30.77	20.65	42.31
Gala-a El Nahal	33.33	23.26	46.08
El Fao	55.31	45.00	66.51
El Qureisha	33.51	25.40	42.21
El Mafaza	40.82	29.80	56.00
Basunda	35.29	26.28	46.94
Western Galabat	18.48	11.51	25.86
Eastern Galabat	32.99	23.33	44.52
Al-Gadarif State	34.85	23.96	45.74

TABLE 88: Measles vaccine coverage by locality and state

Location	First dose measles vaccine for children below 12 months		
	Estimate	95% LCL	95% UCL
Sheikan	17.66	13.13	22.89
Um Rawaba	17.55	12.74	23.03
Um Dam Haj Ahmed	26.67	16.48	38.10
El Rahad	25.00	17.18	33.11
Bara	16.11	8.65	24.41
Gharb Bara	10.73	5.75	16.83
Soudari	6.58	2.55	11.92
Gebrat El Sheikh	24.68	16.66	34.57
North Kordofan State	17.42	10.67	24.16
Kadugli	34.01	25.52	42.53
Reif Shargi	17.26	10.89	26.32
Dilling	21.59	10.26	32.08
El Quoz	26.18	16.59	36.99
Habila	24.16	16.49	34.62
Abassiya	26.20	16.90	35.24
El Rashad	21.94	15.08	30.16
Abu Jubaiha	18.85	13.30	25.25
El Tadamon	14.83	6.84	25.51
Talodi	18.64	7.14	32.79
Ghadeer	14.29	5.25	27.54
El Leri	14.89	9.40	20.55
Abu Karshola	25.71	17.94	37.68
Delami	19.75	9.72	29.14
South Kordofan State	22.51	13.40	31.62
Abu Zabad	23.64	14.59	32.62
ElKhiwai	20.00	12.57	27.48
Ghubaish	13.44	6.32	22.07
El Nuhud	11.88	6.87	19.17
El Idia	17.09	8.93	27.66
Wad Benda	11.97	6.69	18.70
Lagawa	12.77	5.71	22.52
Elsunut	20.09	13.16	26.56
Keilik	29.41	20.95	37.87
Es Salam	31.94	24.44	40.43
Babanusa	9.63	3.25	18.10
Abyei	26.35	13.66	37.22

TABLE 88: Measles vaccine coverage by locality and state

Location	First dose measles vaccine for children below 12 months		
	Estimate	95% LCL	95% UCL
El Dibab	24.29	10.76	38.46
El Meiram	16.33	5.12	33.33
West Kordofan State	17.64	8.66	26.61
El Fasher	34.61	27.69	42.07
Tawila	28.64	18.43	38.69
Melit	18.71	12.84	26.77
Um Kadada	26.67	19.06	35.21
Kebkabiya	56.88	41.85	68.91
Kutum	18.63	11.03	29.69
El Mahalha	18.12	8.66	27.44
Saraf Omra	21.99	11.93	34.17
El Serief	17.68	11.05	25.93
Dar Elsalam	17.07	10.00	24.61
Kelemando	27.05	19.18	35.40
El Tawisha	12.56	7.39	18.85
Um Baru	14.29	4.75	26.67
El Lait	41.27	31.60	52.14
ELkuma	27.84	9.18	53.50
El Tina	0.00	0.00	0.00
Kernoi	25.32	15.71	34.48
North Darfur State	26.18	16.45	35.91
Nyala South	16.84	9.09	26.29
Nyala North	16.13	0.00	30.78
Es Salam	19.16	11.19	27.25
El Wihda	23.81	14.67	35.65
Mershing	29.12	19.84	37.46
Beliel	19.95	14.57	25.00
Nitega	27.34	16.89	40.63
Sharg El Jabal (accessible parts)	0.00	0.00	0.00
Kas	14.44	7.42	23.54
Shattaya	11.35	3.86	21.82
Buram	9.90	4.47	16.40
Gereida	28.05	19.33	37.65
El Sunta	13.45	7.32	21.59
El Radoum	9.89	3.86	17.56
Tulus	18.97	0.00	41.25

TABLE 88: Measles vaccine coverage by locality and state

Location	First dose measles vaccine for children below 12 months		
	Estimate	95% LCL	95% UCL
Damso	18.27	8.10	29.91
Ed Elfursan	34.43	21.62	50.88
Kubum	28.41	16.34	38.35
Kateila	20.16	11.20	29.84
Rehaid Elbirdi	33.73	22.90	45.95
Um Dafoug	14.19	4.00	24.19
South Darfur State	20.62	8.46	32.78
Abu Jabra	29.94	20.53	39.77
Abu Karinka	18.75	9.52	26.42
Bahr El Arab	11.63	4.05	22.24
Adila	29.56	16.74	43.03
Ed Dain	26.92	18.39	37.79
Assalaya	12.70	7.51	18.87
El Firdous	24.42	11.23	39.54
Shia-ria	47.46	36.82	58.42
Yassin	23.12	16.28	30.98
East Darfur State	22.35	12.14	32.57
El Geneina	28.32	20.95	35.33
Habila	16.85	9.07	25.00
Kulbus	36.25	23.72	51.40
Beida	35.40	24.98	50.02
Foro Baranga	15.43	8.09	27.71
Kereneik	21.72	15.82	26.98
Sirba	28.80	19.19	39.13
Jebel Moon	42.86	24.96	60.56
West Darfur State	28.90	18.36	39.43
Zalingi	24.70	18.18	31.11
Wadi Salih	28.65	17.54	39.56
Mukjar	20.74	10.50	34.95
Central Jebel Mara	16.00	4.33	31.82
North Jebel Mara	1.85	0.00	10.72
Bendasi	28.24	12.38	45.25
Nertiti	21.84	12.91	31.22
Azum	19.05	9.09	30.18
Um Dukhun	15.56	8.31	25.35
Central Darfur State	19.38	7.98	30.77

Spatial distribution of measles vaccine coverage

Very low first-dose measles vaccination coverage was evenly spread throughout Sudan *(see Figure 315 and Figure 299)*.

FIGURE 299:
EPI: First-dose measles vaccine for children below 12 months (raster)

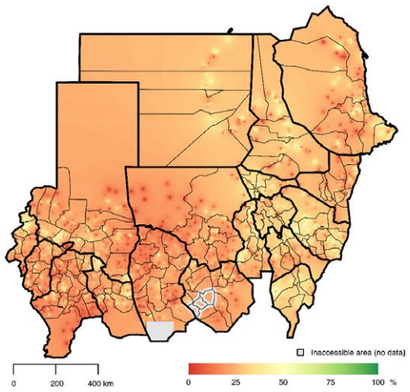
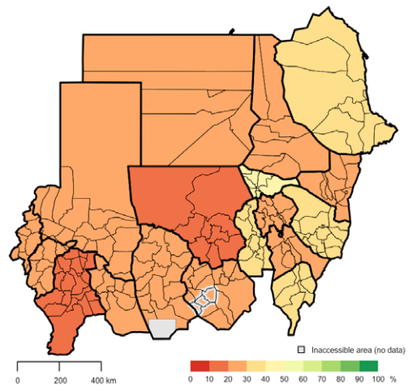


FIGURE 300:
EPI: First-dose measles vaccine for children below 12 months



3.14.5 Full expanded program on immunization (EPI) coverage

Full EPI coverage average results

Full EPI program coverage presented in this report is the percentage of children younger than 12 months old who received BCG, three doses of a pentavalent vaccine and three doses of an oral polio vaccine, and a measles vaccine. This is displayed by the green highlighted sections in the table below. All recommended doses of the vaccines, such as at birth for OPV, are also displayed *(see Table 89)*.

TABLE 89: Sudan vaccination schedule (2018)

Vaccine	Age of Vaccination					
	Birth	6 weeks	10 weeks	14 weeks	9 months	18 months
BCG	x					
OPV	x	x	x	x		
DPT-HepB–Hib	x	x	x	x		
Measles					x	x
Rota virus		x	x			
PCV13		x	x	x		
IPV				x		
Meningitis A vaccine					x	

Full EPI coverage of children younger than 12 months old was 26.7 per cent (95 per cent CI 16.8-36.7 per cent) across Sudan. Khartoum state had the highest full EPI vaccine coverage and North Kordofan state had the lowest full EPI vaccine coverage *(see Figure 301).* In the country, no locality did at least 80 per cent of children younger than 12 months receive the full EPI vaccination package *(see Figure 301).* Table 90 and Table 91 present per locality, per state and national level results of children under 12 months with full EPI vaccination coverage.

FIGURE 301: Box plot of state and locality results for full EPI coverage

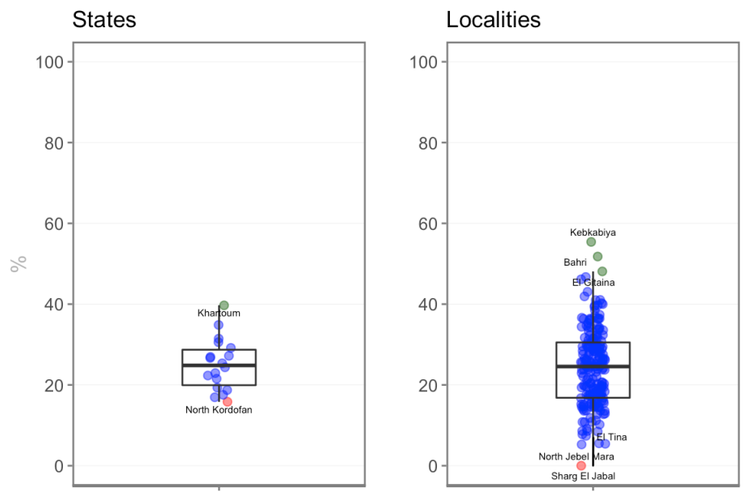


TABLE 90: Full EPI coverage by state and national

State	Full EPI Coverage for Children below 12 months (without rotavirus vaccine)		
	Estimate	95% LCL	95% UCL
Al-Gadarif	30.65	20.75	40.54
Al-Gazeera	27.29	17.79	36.79
Blue Nile	34.78	24.36	45.20
Central Darfur	16.90	6.07	27.74
East Darfur	19.37	9.73	29.01
Kassala	25.25	17.08	33.42
Khartoum	39.73	28.31	51.15
North Darfur	22.89	13.66	32.12
North Kordofan	15.80	9.19	22.41
Northern	29.19	18.37	40.01
Red Sea	22.44	11.88	32.99

TABLE 90: Full EPI coverage by state and national

State	Full EPI Coverage for Children below 12 months (without rotavirus vaccine)		
	Estimate	95% LCL	95% UCL
River Nile	26.61	16.78	36.45
Sennar	26.99	17.87	36.11
South Darfur	18.80	7.81	29.79
South Kordofan	21.62	12.27	30.96
West Darfur	24.41	14.63	34.18
West Kordofan	17.52	8.62	26.42
White Nile	31.52	20.51	42.53
Sudan	26.72	16.74	36.70

TABLE 91: Full EPI coverage by locality and by state

Location	Full EPI Coverage for Children below 12 months (without rotavirus vaccine)		
	Estimate	95% LCL	95% UCL
Dongola	26.16	17.32	38.32
El Golid	36.72	26.46	47.45
Merwoe	26.09	15.28	39.38
El Daba	27.27	17.82	37.44
Halfa	28.16	20.32	36.62
Delgo	36.69	27.55	46.76
El Burgaig	31.63	19.41	44.72
Northern State	29.19	18.37	40.01
El Matama	23.68	12.94	35.08
Shendi	20.00	12.38	27.19
Abu Hamad	36.11	24.18	46.94
Barbar	33.62	21.84	46.26
El Damar	27.27	19.46	35.77
Atbara	21.53	14.03	31.35
El Buhaira	39.63	29.79	48.39
River Nile State	26.61	16.78	36.45
Khartoum	47.66	35.09	63.50
Bahri	51.16	39.41	62.63

TABLE 91: Full EPI coverage by locality and by state

Location	Full EPI Coverage for Children below 12 months (without rotavirus vaccine)		
	Estimate	95% LCL	95% UCL
Um Durman	40.65	32.35	50.35
Um Bada	35.94	27.88	45.46
Jebel Awlia	37.69	24.36	51.49
Sharg Elneel	32.72	22.99	45.71
Karrari	38.64	29.58	46.82
Khartoum State	39.73	28.31	51.15
Greater Medani	28.57	20.51	37.93
Ganub Elgazira	25.11	15.15	34.32
El Hassahisa	27.68	18.71	36.39
El Kamlin	13.55	7.14	22.23
Sharg El Gezira	28.14	19.76	37.65
Um Elqura	20.00	10.31	30.43
El Manaqil	32.61	21.63	42.67
El Qurashi	31.64	23.83	39.64
Al-Gazeera State	27.29	17.79	36.79
Sennar	33.12	27.37	40.46
Sharg Sennar	30.41	20.52	41.57
Sinja	29.46	22.18	36.12
Abu Hujar	12.36	7.43	19.43
El Dali	21.43	12.06	33.81
Es Suki	27.71	17.43	40.45
Ed Dinder	22.15	13.56	32.93
Sennar State	26.99	17.87	36.11
Ed Damazine	29.58	21.11	40.02
El Tadamon	41.15	32.04	51.52
El Roseiris	38.75	30.92	45.89
Baw	34.78	25.92	42.31
Geisan	28.57	19.86	37.74
El Kurmuk	39.64	26.74	54.55
Wad El Mahi	31.82	21.81	43.44
Blue Nile State	34.78	24.36	45.20
Kosti	23.35	15.98	32.64
Guli	24.86	15.87	33.55
Tendalti	33.33	23.44	43.94

TABLE 91: Full EPI coverage by locality and by state

Location	Full EPI Coverage for Children below 12 months (without rotavirus vaccine)		
	Estimate	95% LCL	95% UCL
Es Salam	15.18	8.51	22.69
Rabak	29.57	21.34	37.19
El Jabalain	25.91	17.36	36.06
El Diwaim	34.13	24.46	43.52
Um Rimta	36.05	23.66	47.88
El Gitaina	56.76	37.93	77.68
White Nile State	31.52	20.51	42.53
Port Sudan	25.00	16.94	33.76
Swakin	24.64	14.47	35.91
El Gonob Welawlaib	28.81	17.11	39.52
Sinkat	37.22	23.46	51.58
Haya	4.84	0.00	15.10
Dordieb	31.55	18.78	43.26
Tokar	30.45	22.86	37.88
Agig	44.62	27.95	60.00
Gabaot Elma-aadin	24.14	10.70	36.68
Halaeeb (accessible parts)	10.71	0.00	32.07
Red Sea State	22.44	11.88	32.99
Kassala Town	32.45	23.75	41.54
Refi Kassla	31.65	23.43	40.88
Rural Western Kassala	20.74	14.21	27.89
New Halfa	22.58	14.62	31.28
Refi Nahr Atbara	31.18	23.43	41.21
Rural Khashm Elgirba	21.10	13.87	27.40
Rural Wad Elhilaiw	20.26	13.50	27.46
Rural Aroma	17.24	11.28	23.82
Refi North Delta	18.82	9.94	27.51
Refi Hamashkureib	27.52	20.08	34.25
Rural Telkok	19.77	12.63	28.40
Kassala State	25.25	17.08	33.42
Gedaref Town	24.37	14.85	34.98
Middle Geddaref	34.62	24.67	44.64
Elbutana	25.84	17.76	34.09

TABLE 91: Full EPI coverage by locality and by state

Location	Full EPI Coverage for Children below 12 months (without rotavirus vaccine)		
	Estimate	95% LCL	95% UCL
El Fashaga	34.42	21.13	48.02
El Rahad	25.93	19.10	34.36
Gala-a El Nahal	32.31	21.56	42.93
El Fao	38.31	28.70	47.02
El Qureisha	33.33	24.85	40.89
El Mafaza	38.65	27.51	51.60
Basunda	35.43	25.13	45.50
Western Galabat	17.24	10.42	25.36
Eastern Galabat	28.77	20.24	38.32
Al-Gadarif State	30.65	20.75	40.54
Sheikan	16.55	12.60	21.86
Um Rawaba	15.73	11.74	20.11
Um Dam Haj Ahmed	23.12	14.42	33.18
El Rahad	18.93	11.18	27.78
Bara	13.92	7.35	22.73
Gharb Bara	10.73	5.90	16.85
Soudari	6.61	2.27	12.60
Gebrat El Sheikh	23.58	15.92	32.29
North Kordofan State	15.80	9.19	22.41
Kadugli	33.55	24.80	42.45
Reif Shargi	17.49	9.19	28.59
Dilling	21.79	9.83	33.33
El Quoz	22.27	10.63	33.92
Habila	24.27	15.41	32.43
Abassiya	25.76	16.32	35.52
El Rashad	17.56	10.49	25.49
Abu Jubaiha	19.53	13.39	25.53
El Tadamon	14.71	5.88	28.18
Talodi	18.64	6.97	31.26
Ghadeer	14.62	5.04	26.63
El Leri	14.85	9.37	20.61
Abu Karshola	25.40	17.17	35.97
Delami	19.69	10.71	28.15
South Kordofan State	21.62	12.27	30.96

TABLE 91: Full EPI coverage by locality and by state

Location	Full EPI Coverage for Children below 12 months (without rotavirus vaccine)		
	Estimate	95% LCL	95% UCL
Abu Zabad	22.50	13.09	34.66
ElKhiwai	19.89	11.49	28.40
Ghubaish	13.62	5.74	21.80
El Nuhud	11.96	6.82	19.01
El Idia	17.89	8.51	30.12
Wad Benda	10.81	5.88	17.34
Lagawa	13.18	5.80	24.49
Elsunut	20.20	13.15	26.54
Keilik	28.74	21.18	36.44
Es Salam	32.32	24.83	40.01
Babanusa	9.81	3.34	16.77
Abyei	26.25	14.89	38.53
El Dibab	22.81	10.34	37.14
El Meiram	16.67	4.65	35.33
West Kordofan State	17.52	8.62	26.42
El Fasher	28.96	22.98	35.12
Tawila	25.75	16.66	35.80
Melit	19.07	12.11	25.99
Um Kadada	26.44	18.13	35.23
Kebkabiya	55.83	42.89	67.47
Kutum	16.67	8.97	25.62
El Mahalha	15.76	7.91	24.53
Saraf Omra	17.36	8.13	27.33
El Serief	3.68	0.66	7.88
Dar Elsalam	16.54	9.73	24.17
Kelemando	26.37	17.98	35.56
El Tawisha	12.40	7.46	18.24
Um Baru	13.93	5.55	26.23
El Lait	40.60	30.70	50.02
ELkuma	28.57	7.93	56.69
El Tina	0.00	0.00	0.00
Kernoi	17.16	9.76	25.95
North Darfur State	22.89	13.66	32.12
Nyala South	17.01	9.71	26.32

TABLE 91: Full EPI coverage by locality and by state

Location	Full EPI Coverage for Children below 12 months (without rotavirus vaccine)		
	Estimate	95% LCL	95% UCL
Nyala North	16.28	2.22	30.00
Es Salam	18.22	10.87	27.07
El Wihda	23.53	14.11	34.95
Mershing	28.92	20.07	36.23
Beliel	19.84	15.40	24.62
Nitega	15.13	8.07	24.33
Sharg El Jabal (accessible parts)	0.00	0.00	0.00
Kas	14.71	7.41	22.49
Shattaya	9.36	2.94	18.13
Buram	8.51	3.07	15.66
Gereida	28.26	18.71	38.48
El Sunta	13.33	6.87	20.79
El Radoum	8.50	3.10	15.57
Tulus	15.00	0.00	32.35
Damso	16.19	7.20	27.28
Ed Elfursan	34.23	20.17	49.39
Kubum	24.19	15.00	33.25
Kateila	19.72	10.40	29.68
Rehaid Elbirdi	29.61	18.83	40.67
Um Dafoug	12.27	3.73	22.30
South Darfur State	18.80	7.81	29.79
Abu Jabra	18.32	10.25	27.75
Abu Karinka	18.92	9.93	26.90
Bahr El Arab	8.33	2.29	16.09
Adila	26.53	12.87	41.54
Ed Dain	26.92	18.04	38.10
Assalaya	11.63	6.83	17.58
El Firdous	17.86	6.84	29.39
Shia-ria	43.88	33.33	55.50
Yassin	19.56	12.56	27.43
East Darfur State	19.37	9.73	29.01
El Geneina	23.95	17.01	31.63
Habila	13.24	6.48	21.10
Kulbus	26.49	16.58	38.56

TABLE 91: Full EPI coverage by locality and by state

Location	Full EPI Coverage for Children below 12 months (without rotavirus vaccine)		
	Estimate	95% LCL	95% UCL
Beida	30.06	19.99	40.72
Foro Baranga	15.33	7.76	26.99
Kereneik	18.75	13.13	24.94
Sirba	23.70	14.78	33.18
Jebel Moon	40.35	25.27	59.44
West Darfur State	24.41	14.63	34.18
Zalingi	22.84	16.54	28.69
Wadi Salih	28.00	17.26	39.08
Mukjar	14.00	3.70	29.33
Central Jebel Mara	15.25	5.23	31.03
North Jebel Mara	1.75	0.00	12.14
Bendasi	26.27	10.74	45.79
Nertiti	16.42	9.73	24.28
Azum	7.26	1.62	13.64
Um Dukhun	16.00	8.33	24.68
Central Darfur State	16.90	6.07	27.74

Spatial distribution of full EPI coverage

The very low rate of full vaccination coverage was evenly distributed throughout Sudan *(see Figure 302)*.

FIGURE 302:
EPI: Full EPI coverage for children below 12 months (without rotavirus vaccine) (raster)

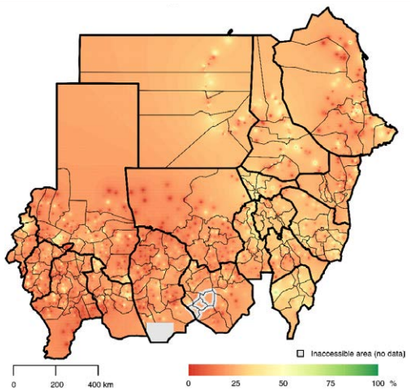
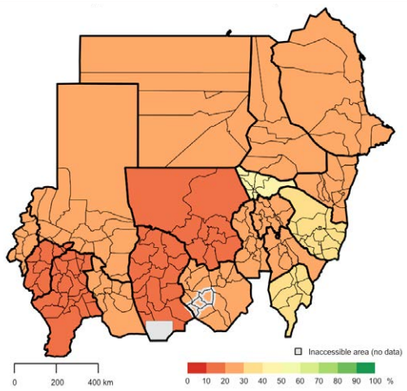


FIGURE 303:
EPI: Full EPI coverage for children below 12 months (without rotavirus vaccine)



3.15 Coverage of insecticide-treated nets (ITN)

Coverage of ITN average results

The proportion of children younger than 59 months old who slept under an insecticide-treated net (ITN) the night before the survey was 38.5 per cent (95 per cent CI 29.2 – 47.7 per cent) across Sudan. Blue Nile state had the highest proportion of children younger than 59 months old who slept under an ITN, while Red Sea state had the lowest proportion *(see Figure 304)*. Only 42.7 per cent of localities achieved greater than 50 per cent coverage of children younger than 59 months old who slept under an ITN the previous night.

Table 92 and Table 93 present results by locality, by state and at the national level for coverage of children younger than 59 months old who slept under an ITN the previous night.

FIGURE 304: Box plot of state and locality results for ITNs

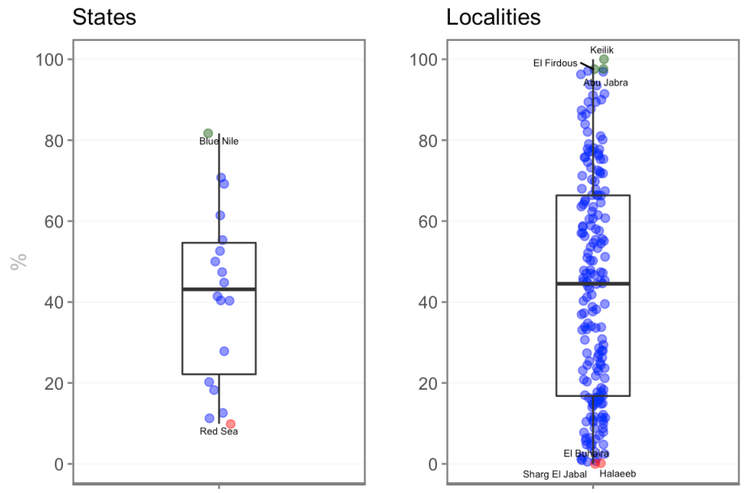


TABLE 92: Child slept under ITN during previous night by state and national

State	Slept under ITN during Previous Night		
	Estimate	95% LCL	95% UCL
Al-Gadarif	40.42	26.91	53.92
Al-Gazeera	20.25	12.02	28.49
Blue Nile	81.67	75.44	87.90
Central Darfur	41.47	28.90	54.05
East Darfur	70.73	58.74	82.71
Kassala	27.85	19.13	36.57

TABLE 92: Child slept under ITN during previous night by state and national

State	Slept under ITN during Previous Night		
	Estimate	95% LCL	95% UCL
Khartoum	18.31	12.26	24.36
North Darfur	61.39	50.59	72.19
North Kordofan	50.04	40.52	59.56
Northern	12.59	6.37	18.81
Red Sea	9.90	4.74	15.05
River Nile	11.32	6.23	16.41
Sennar	47.42	37.37	57.48
South Darfur	55.34	43.66	67.03
South Kordofan	40.27	30.65	49.88
West Darfur	52.56	40.85	64.27
West Kordofan	69.18	61.39	76.97
White Nile	44.80	34.61	54.99
Sudan	38.48	29.24	47.73

TABLE 93: Child slept under ITN during previous night by locality and by state

Location	Slept under ITN during Previous Night		
	Estimate	95% LCL	95% UCL
Dongola	20.91	14.57	26.94
El Golid	10.71	7.36	14.58
Merwoe	6.98	2.73	12.99
El Daba	17.98	10.20	29.01
Halfa	6.14	2.40	10.39
Delgo	1.56	0.30	3.45
El Burgaig	6.93	4.36	10.08
Northern State	12.59	6.37	18.81
El Matama	14.25	8.11	21.70
Shendi	1.76	0.39	3.64
Abu Hamad	16.30	10.85	22.46
Barbar	6.64	1.87	13.27
El Damar	10.43	6.95	14.45
Atbara	31.63	22.67	39.53
El Buhaira	0.10	0.00	0.69
River Nile State	11.32	6.23	16.41

TABLE 93: Child slept under ITN during previous night by locality and by state

Location	Slept under ITN during Previous Night		
	Estimate	95% LCL	95% UCL
Khartoum	16.62	10.12	24.80
Bahri	23.13	14.90	32.17
Um Durman	15.79	11.62	19.58
Um Bada	17.35	12.19	22.29
Jebel Awlia	26.15	21.08	31.22
Sharg Elneel	14.67	9.15	20.41
Karrari	12.32	6.53	20.17
Khartoum State	18.31	12.26	24.36
Greater Medani	32.82	24.01	40.54
Ganub Elgazira	24.08	17.62	31.69
El Hassahisa	10.83	5.59	18.65
El Kamlin	16.64	6.17	31.64
Sharg El Gezira	7.04	2.54	14.05
Um Elqura	25.96	19.32	32.72
El Manaqil	30.57	22.63	39.29
El Qurashi	11.73	5.04	21.94
Al-Gazeera State	20.25	12.02	28.49
Sennar	42.95	36.68	47.92
Sharg Sennar	57.36	43.68	70.24
Sinja	63.03	51.75	73.68
Abu Hujar	22.56	11.29	36.47
El Dali	32.67	24.77	40.95
Es Suki	47.25	38.31	56.93
Ed Dinder	51.82	42.44	61.09
Sennar State	47.42	37.37	57.48
Ed Damazine	93.59	89.66	96.35
El Tadamon	96.91	92.35	99.07
El Roseiris	80.75	74.17	87.22
Baw	54.09	43.62	63.91
Geisan	87.72	79.49	93.83
El Kurmuk	66.67	58.08	75.60
Wad El Mahi	90.21	85.99	93.57
Blue Nile State	81.67	75.44	87.90
Kosti	73.78	63.63	82.41
Guli	20.53	11.43	30.79
Tendalti	15.75	7.34	26.02
Es Salam	54.99	46.55	65.10

TABLE 93: Child slept under ITN during previous night by locality and by state

Location	Slept under ITN during Previous Night		
	Estimate	95% LCL	95% UCL
Rabak	79.10	69.78	87.37
El Jabalain	57.09	42.21	73.36
El Diwaim	15.25	7.45	25.22
Um Rimta	3.31	0.16	8.57
El Gitaina	36.18	23.84	47.91
White Nile State	44.80	34.61	54.99
Port Sudan	32.24	25.21	39.80
Swakin	14.36	4.69	26.58
El Gonob Welawlaib	4.98	2.21	8.58
Sinkat	0.90	0.00	2.13
Haya	0.83	0.00	2.44
Dordieb	0.49	0.00	1.62
Tokar	9.63	4.73	14.18
Agig	14.94	6.39	23.32
Gabaot Elma-aadin	2.65	0.86	5.10
Halaeeb (accessible parts)	0.00	0.00	0.00
Red Sea State	9.90	4.74	15.05
Kassala Town	51.98	38.88	63.77
Refi Kassla	33.22	23.99	41.57
Rural Western Kassala	1.67	0.10	3.86
New Halfa	47.03	35.12	57.96
Refi Nahr Atbara	23.15	16.33	31.57
Rural Khashm Elgirba	59.32	51.04	69.57
Rural Wad Elhilaiw	42.66	34.95	50.72
Rural Aroma	10.03	5.75	16.87
Refi North Delta	17.06	8.46	26.49
Refi Hamashkureib	5.17	0.40	10.84
Rural Telkok	6.27	3.65	9.28
Kassala State	27.85	19.13	36.57
Gedaref Town	26.63	15.49	39.98
Middle Geddaref	13.92	5.47	30.03
Elbutana	4.39	1.47	8.17
El Fashaga	8.94	3.09	17.22
El Rahad	50.68	33.78	65.68
Gala-a El Nahal	36.77	22.31	51.24
El Fao	33.64	24.56	41.93

TABLE 93: Child slept under ITN during previous night by locality and by state

Location	Slept under ITN during Previous Night		
	Estimate	95% LCL	95% UCL
El Qureisha	66.38	56.44	76.32
El Mafaza	47.12	31.18	61.07
Basunda	69.16	52.69	79.55
Western Galabat	54.22	32.37	75.13
Eastern Galabat	67.71	54.01	79.49
Al-Gadarif State	40.42	26.91	53.92
Sheikan	69.87	61.61	77.62
Um Rawaba	62.53	52.66	73.45
Um Dam Haj Ahmed	28.61	20.68	36.99
El Rahad	86.20	77.96	93.16
Bara	23.68	16.66	33.39
Gharb Bara	52.07	36.29	65.03
Soudari	24.11	13.50	37.62
Gebrat El Sheikh	18.33	10.09	26.97
North Kordofan State	50.04	40.52	59.56
Kadugli	77.45	72.14	82.89
Reif Shargi	73.36	62.81	85.06
Dilling	55.39	42.72	67.22
El Quoz	38.50	32.16	44.33
Habila	44.16	33.45	55.36
Abassiya	22.37	14.44	31.70
El Rashad	45.79	32.14	59.88
Abu Jubaiha	31.60	24.23	39.18
El Tadamon	30.19	20.99	41.07
Talodi	10.53	5.17	18.83
Ghadeer	25.89	14.54	44.46
El Leri	10.14	6.80	15.10
Abu Karshola	46.91	38.41	55.60
Delami	44.72	32.65	56.88
South Kordofan State	40.27	30.65	49.88
Abu Zabad	62.50	50.50	73.59
ElKhiwai	66.62	57.94	75.70
Ghubaish	49.66	44.54	54.37
El Nuhud	66.45	58.23	73.51
El Idia	64.27	56.84	71.11
Wad Benda	54.44	45.42	63.14
Lagawa	97.05	94.56	98.79

TABLE 93: Child slept under ITN during previous night by locality and by state

Location	Slept under ITN during Previous Night		
	Estimate	95% LCL	95% UCL
Elsunut	70.73	64.02	78.29
Keilik	100.00	99.10	100.00
Es Salam	93.81	87.74	97.96
Babanusa	79.61	74.20	85.37
Abyei	91.30	86.39	95.89
El Dibab	82.18	70.03	96.03
El Meiram	51.81	43.32	60.93
West Kordofan State	69.18	61.39	76.97
El Fasher	74.22	66.40	81.22
Tawila	41.82	31.03	52.82
Melit	48.63	36.20	60.64
Um Kadada	89.36	83.98	93.43
Kebkabiya	87.61	77.92	94.50
Kutum	67.25	57.47	77.15
El Mahalha	47.14	36.72	57.38
Saraf Omra	44.87	32.41	59.77
El Serief	60.75	48.13	70.63
Dar Elsalam	47.81	42.41	53.51
Kelemando	64.92	57.48	72.06
El Tawisha	24.28	18.28	29.97
Um Baru	51.49	43.25	62.22
El Lait	66.18	59.96	71.48
ELkuma	91.62	71.66	97.80
El Tina	10.00	0.00	30.50
Kernoi	69.99	64.34	75.57
North Darfur State	61.39	50.59	72.19
Nyala South	62.39	53.81	69.52
Nyala North	66.84	47.75	99.07
Es Salam	77.54	68.85	85.08
El Wihda	58.67	50.00	65.37
Mershing	57.85	48.00	66.58
Beliel	75.71	68.29	82.40
Nitega	56.34	42.61	72.27
Sharg El Jabal (accessible parts)	0.00	0.00	0.00
Kas	39.30	30.36	47.67
Shattaya	14.76	9.90	20.41

TABLE 93: Child slept under ITN during previous night by locality and by state

Location	Slept under ITN during Previous Night		
	Estimate	95% LCL	95% UCL
Buram	11.04	6.68	16.93
Gereida	36.49	27.37	47.97
El Sunta	52.12	41.83	62.66
El Radoum	81.03	77.69	84.26
Tulus	33.17	18.13	48.72
Damso	32.46	21.48	46.11
Ed Elfursan	60.08	52.37	67.54
Kubum	75.00	69.97	80.04
Kateila	61.41	52.61	70.50
Rehaid Elbirdi	77.44	67.23	86.97
Um Dafoug	87.92	78.43	94.45
South Darfur State	55.34	43.66	67.03
Abu Jabra	96.80	92.31	99.34
Abu Karinka	38.19	27.33	51.84
Bahr El Arab	73.33	57.54	88.58
Adila	66.62	52.61	79.26
Ed Dain	78.61	70.35	86.67
Assalaya	50.26	36.38	68.22
El Firdous	95.86	91.65	98.29
Shia-ria	96.14	93.86	97.96
Yassin	84.10	75.37	90.59
East Darfur State	70.73	58.74	82.71
El Geneina	58.22	48.03	69.72
Habila	65.06	42.67	82.85
Kulbus	42.25	26.19	56.98
Beida	90.05	82.13	96.22
Foro Baranga	20.44	8.11	35.22
Kereneik	73.78	66.35	79.54
Sirba	26.13	16.42	38.84
Jebel Moon	38.34	29.80	45.87
West Darfur State	52.56	40.85	64.27
Zalingi	68.39	61.26	75.98
Wadi Salih	68.38	55.27	81.12
Mukjar	34.12	18.77	50.88
Central Jebel Mara	42.53	28.17	56.30
North Jebel Mara	19.28	8.09	34.97
Bendasi	17.36	8.79	26.56

TABLE 93: Child slept under ITN during previous night by locality and by state

Location	Slept under ITN during Previous Night		
	Estimate	95% LCL	95% UCL
Nertiti	16.52	8.35	25.48
Azum	46.25	39.20	52.54
Um Dukhun	28.00	16.85	42.42
Central Darfur State	41.47	28.90	54.05

Spatial distribution of ITN coverage

The spatial trend of ITN coverage increased from the north and northeast of Sudan toward the west and south of Sudan *(see Figure 305)*.

FIGURE 305:
Child: Slept under ITN during previous night (raster)

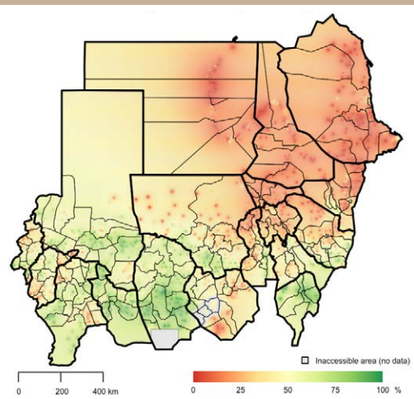
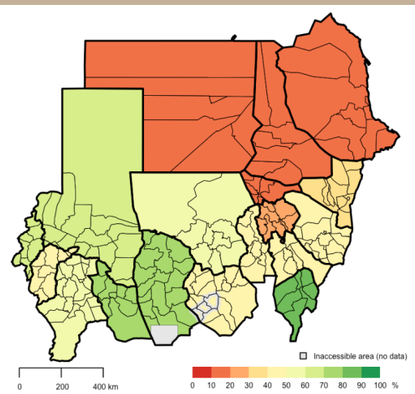


FIGURE 306:
Child: slept under ITN during previous night



3.16 Time to health facility

Time to health facility average results

Across Sudan, 64 per cent of carers of children reported being able to access a health facility in under 30 minutes (95 per cent CI: 48-80 per cent). The percentage who reported being able to access a health facility in under an hour was 80.2 per cent (95 per cent CI: 66.4-94.1 per cent).

Among states, 72.2 per cent had more than 50 per cent of carers who reported the ability to access a health facility within 30 minutes; and in all states, more than half of caregivers reported health facility access within one hour. East Darfur state had the lowest proportion of carers who reported being able to access a health facility within either 30 minutes or within one hour *(see Figure 307)*. Among localities, 64.3 per cent had more than 50 per cent of carers who reported being able to access a health facility within 30 minutes, and 85.4 per cent could do so within one hour.

FIGURE 307: Box plot of state results of time to health facility

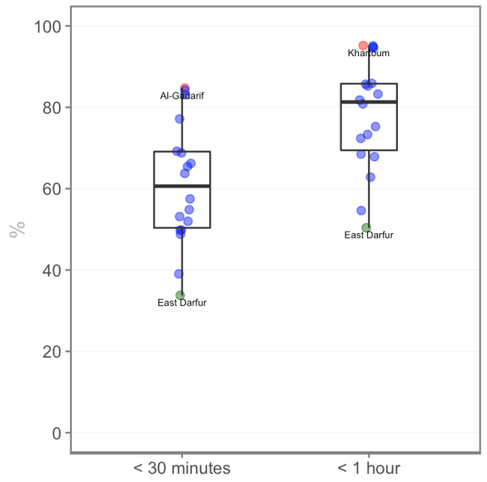


FIGURE 308: Box plot of locality results of time to health

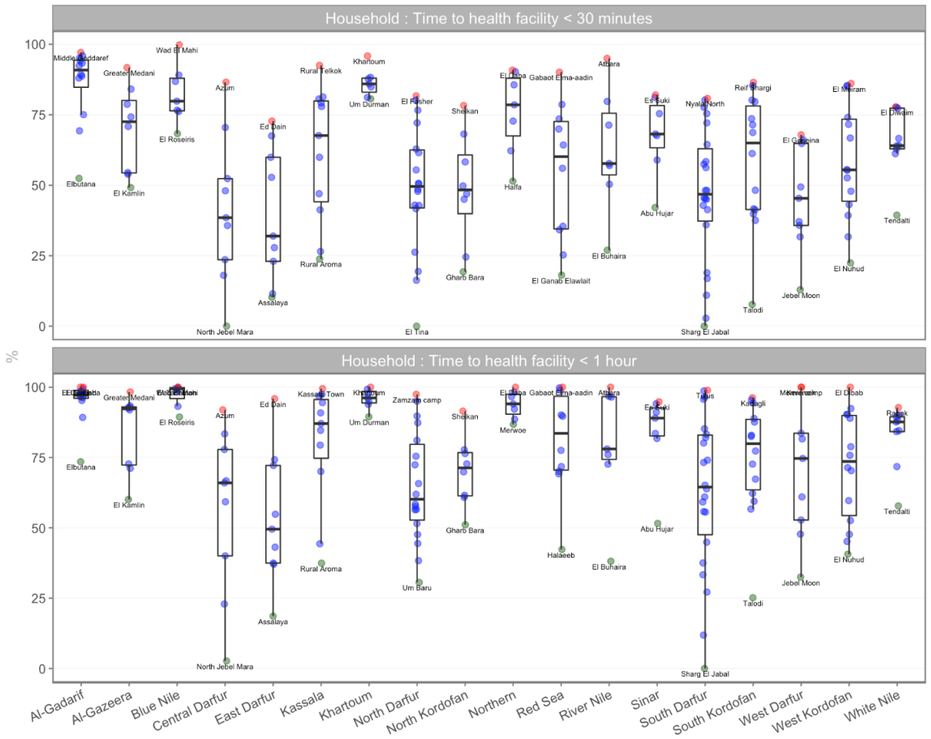


TABLE 94: Time to health facility by state and national

State	Time to Health Facility (hours)			Time to Health Facility < 30 minutes %			Time to Health Facility < 1 hour %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	0.42	0.25	0.59	84.74	73.28	96.20	94.61	87.00	99.99
Al-Gazeera	0.69	0.40	0.97	65.47	46.67	84.26	83.24	69.82	96.66
Blue Nile	0.48	0.23	0.74	77.17	63.16	91.18	95.09	87.25	99.99
Central Darfur	1.45	0.82	2.08	39.04	20.93	57.14	54.61	36.53	72.70
East Darfur	1.60	1.00	2.20	33.76	18.09	49.43	50.39	32.75	68.02
Kassala	0.75	0.25	1.25	68.76	53.63	83.89	85.84	74.40	97.27
Khartoum	0.43	0.21	0.64	84.21	72.10	96.31	95.18	86.40	99.99
North Darfur	1.21	0.57	1.86	53.13	35.79	70.46	67.84	49.64	86.04
North Kordofan	1.00	0.63	1.37	54.84	41.22	68.46	73.30	60.59	86.00
Northern	0.43	0.11	0.76	83.09	70.72	95.46	94.74	85.78	99.99
Red Sea	1.00	0.43	1.57	51.97	33.70	70.23	81.78	65.55	98.01
River Nile	0.86	0.40	1.32	63.76	49.70	77.82	85.25	74.22	96.28
Sennar	0.74	0.31	1.16	69.22	52.62	85.82	85.67	73.07	98.27
South Darfur	1.13	0.69	1.57	49.83	30.10	69.57	68.46	50.71	86.21
South Kordofan	0.98	0.50	1.46	57.47	39.22	75.72	75.27	57.63	92.92
West Darfur	1.09	0.63	1.55	48.80	32.45	65.16	72.36	56.33	88.39
West Kordofan	1.55	0.86	2.25	49.77	31.22	68.32	62.82	45.17	80.46
White Nile	0.88	0.48	1.28	66.19	50.90	81.49	80.80	66.81	94.79
Sudan	0.86	0.43	1.29	63.99	47.97	80.02	80.24	66.42	94.05

TABLE 95: Time to health facility by locality and state

Location	Time to Health Facility (hours)			Time to Health Facility < 30 minutes %			Time to Health Facility < 1 hour %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	0.35	0.28	0.43	91.29	83.38	96.04	98.40	94.92	100.00
El Golid	0.46	0.36	0.60	78.66	62.52	89.70	96.46	90.59	99.80
Merwoe	0.62	0.34	1.41	84.23	63.85	96.83	85.55	68.70	97.99
El Daba	0.27	0.18	0.38	89.93	78.20	98.60	100.00	100.00	100.00
Halfa	0.47	0.37	0.61	70.87	59.63	82.85	94.44	86.96	98.69
Delgo	0.48	0.34	0.66	69.15	53.32	82.77	92.76	81.66	99.19
El Burgaig	0.48	0.35	0.65	72.69	55.71	86.31	94.78	82.29	100.00
Northern State	0.43	0.11	0.76	83.09	70.72	95.46	94.74	85.78	99.99
El Matama	0.83	0.60	1.08	52.22	36.66	69.62	75.59	61.74	88.77

TABLE 95: Time to health facility by locality and state

Location	Time to Health Facility (hours)			Time to Health Facility < 30 minutes %			Time to Health Facility < 1 hour %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Shendi	1.50	0.84	2.48	55.46	38.75	68.89	73.71	58.93	87.36
Abu Hamad	1.07	0.74	1.47	33.97	17.98	54.22	79.48	62.78	92.35
Barbar	0.58	0.41	0.94	79.31	68.48	88.10	95.67	86.22	100.00
El Damar	0.55	0.45	0.76	71.24	60.34	82.00	96.74	91.54	99.20
Atbara	0.33	0.26	0.47	91.62	83.66	97.45	100.00	91.29	100.00
El Buhaira	1.51	1.14	1.98	32.24	18.80	47.52	45.85	29.89	63.80
River Nile State	0.86	0.40	1.32	63.76	49.70	77.82	85.25	74.22	96.28
Khartoum	0.27	0.22	0.34	95.58	87.07	99.60	100.00	100.00	100.00
Bahri	0.36	0.29	0.84	86.16	73.04	94.66	99.06	93.76	100.00
Um Durman	0.52	0.32	0.83	81.03	66.15	92.98	89.92	75.97	98.67
Um Bada	0.45	0.30	0.79	81.55	66.12	93.76	93.35	81.02	100.00
Jebel Awlia	0.40	0.27	0.68	86.34	73.55	95.97	97.59	82.57	100.00
Sharg Elneel	0.45	0.31	0.92	80.07	65.98	91.61	94.40	84.25	100.00
Karrari	0.54	0.36	0.83	76.91	62.26	89.49	91.78	79.30	98.50
Khartoum State	0.43	0.21	0.64	84.21	72.10	96.31	95.18	86.40	99.99
Greater Medani	0.30	0.24	0.41	92.78	83.76	97.69	98.45	95.24	99.83
Ganub Elgazira	0.61	0.43	0.81	66.67	51.12	79.71	88.84	80.40	95.59
El Hassahisa	0.65	0.44	0.89	66.54	47.22	82.32	89.52	78.01	97.60
El Kamlin	1.01	0.67	1.37	48.66	28.27	69.94	59.79	40.74	77.55
Sharg El Gezira	1.01	0.62	1.44	52.65	33.00	69.99	72.61	54.44	88.52
Um Elqura	0.48	0.34	0.69	81.09	64.64	91.42	90.89	83.32	96.22
El Manaqil	0.64	0.46	0.89	69.54	48.18	88.52	90.02	75.41	100.00
El Qurashi	0.76	0.50	1.08	52.61	30.06	74.49	71.36	53.42	88.66
Al-Gazeera State	0.69	0.40	0.97	65.47	46.67	84.26	83.24	69.82	96.66
Sennar	0.47	0.34	0.69	81.30	70.31	90.15	92.97	86.63	97.65
Sharg Sennar	0.62	0.38	0.91	67.89	46.18	85.67	87.59	76.14	97.36
Sinja	0.56	0.36	0.85	75.14	61.01	86.36	91.14	77.92	98.59
Abu Hujar	1.63	0.84	2.50	43.00	21.56	61.87	56.05	35.07	74.67
El Dali	1.21	0.48	1.95	63.58	45.57	76.81	77.65	55.84	95.06
Es Suki	0.58	0.42	0.79	77.49	62.80	89.25	93.09	86.10	98.18
Ed Dinder	0.84	0.43	1.37	61.40	40.45	81.33	80.72	59.03	95.94
Sennar State	0.74	0.31	1.16	69.22	52.62	85.82	85.67	73.07	98.27
Ed Damazine	0.56	0.44	0.71	68.65	56.60	79.44	95.93	88.94	99.74
El Tadamon	0.41	0.36	0.46	76.37	64.91	85.54	100.00	100.00	100.00
El Roseiris	0.75	0.52	1.23	66.53	54.37	76.47	88.61	78.41	95.73
Baw	0.43	0.34	0.61	75.37	61.70	86.27	97.03	87.36	100.00

TABLE 95: Time to health facility by locality and state

Location	Time to Health Facility (hours)			Time to Health Facility < 30 minutes %			Time to Health Facility < 1 hour %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Geisan	0.28	0.20	0.38	89.87	72.53	100.00	100.00	96.60	100.00
El Kurmuk	0.32	0.14	0.70	87.15	61.68	100.00	92.91	75.41	100.00
Wad El Mahi	0.27	0.21	0.42	96.86	88.47	100.00	99.02	92.59	100.00
Blue Nile State	0.48	0.23	0.74	77.17	63.16	91.18	95.09	87.25	99.99
Kosti	0.79	0.60	1.03	63.69	52.06	75.54	83.77	74.15	92.12
Guli	0.75	0.51	1.00	57.69	41.12	74.43	77.23	58.56	93.01
Tendalti	1.78	1.25	2.42	40.37	26.76	53.17	61.47	48.49	74.58
Es Salam	0.94	0.58	1.43	58.82	39.62	80.27	69.05	46.48	86.50
Rabak	0.49	0.37	0.68	80.93	71.90	89.64	94.86	88.04	98.39
El Jabalain	1.39	0.59	2.37	60.23	40.79	76.76	73.80	54.82	91.59
El Diwaim	0.75	0.42	1.33	78.06	56.77	91.59	85.71	65.86	97.10
Um Rimta	0.92	0.58	1.47	61.75	48.01	74.86	82.90	69.37	93.85
El Gitaina	0.69	0.46	0.98	69.43	52.46	85.11	79.67	62.11	92.29
White Nile State	0.88	0.48	1.28	66.19	50.90	81.49	80.80	66.81	94.79
Port Sudan	0.50	0.38	0.63	63.57	47.26	79.60	98.60	95.82	100.00
Swakin	0.44	0.33	0.57	78.57	66.74	89.13	100.00	98.68	100.00
El Gonob Welawlaib	1.01	0.86	1.24	38.28	24.69	49.34	78.96	70.71	84.73
Sinkat	2.61	1.55	3.90	26.68	18.56	36.45	71.79	56.38	83.74
Haya	0.96	0.63	1.30	36.11	24.70	49.34	70.55	54.02	88.76
Dordieb	0.71	0.36	1.46	66.67	49.24	82.41	90.48	79.79	98.15
Tokar	0.92	0.53	1.54	56.51	43.60	68.48	81.33	60.40	98.29
Agig	0.51	0.30	0.79	77.39	57.81	92.61	89.42	74.41	100.00
Gabaot Elma-aadin	0.27	0.21	0.33	91.63	84.86	96.02	100.00	98.24	100.00
Halaeeb (accessible parts)	1.04	0.37	2.09	58.97	10.13	91.27	69.33	29.93	92.08
Red Sea State	1.00	0.43	1.57	51.97	33.70	70.23	81.78	65.55	98.01
Kassala Town	0.42	0.32	0.52	80.14	63.90	91.08	99.67	97.57	100.00
Refi Kassla	0.53	0.39	0.74	82.53	72.99	90.46	90.29	82.15	96.25
Rural Western Kassala	0.87	0.67	1.07	44.91	31.44	61.00	72.46	57.41	85.82
New Halfa	0.51	0.36	0.81	75.04	59.26	87.89	91.81	80.61	99.85
Refi Nahr Atbara	0.63	0.35	1.03	78.36	61.75	91.61	83.80	67.79	96.23
Rural Khashm Elgirba	0.46	0.35	0.59	69.17	49.97	83.06	97.92	91.85	100.00
Rural Wad Elhilaiw	0.91	0.55	1.40	59.08	43.42	75.42	88.30	76.15	96.49
Rural Aroma	2.43	1.72	3.19	17.44	3.67	36.57	28.63	12.38	50.88
Refi North Delta	2.09	1.36	3.03	24.45	9.28	48.25	47.45	27.20	67.54

TABLE 95: Time to health facility by locality and state

Location	Time to Health Facility (hours)			Time to Health Facility < 30 minutes %			Time to Health Facility < 1 hour %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi Hamashkureib	0.90	0.45	2.28	60.08	41.30	76.01	87.53	74.84	96.63
Rural Telkok	0.32	0.23	0.51	92.25	79.83	98.84	96.61	84.00	100.00
Kassala State	0.75	0.25	1.25	68.76	53.63	83.89	85.84	74.40	97.27
Gedaref Town	0.50	0.39	0.63	72.62	57.25	85.23	91.34	82.14	98.63
Middle Geddaref	0.28	0.23	0.34	97.22	92.51	99.81	99.36	96.62	100.00
Elbutana	0.98	0.66	1.30	52.51	34.40	69.55	72.36	58.94	84.56
El Fashaga	0.40	0.27	0.57	88.04	73.40	97.83	96.54	85.79	99.81
El Rahad	0.42	0.28	0.61	83.94	67.84	96.39	94.35	84.51	100.00
Gala-a El Nahal	0.39	0.30	0.57	80.18	65.80	90.87	98.35	88.15	100.00
El Fao	0.38	0.23	0.65	92.29	83.73	98.77	96.81	89.82	100.00
El Qureisha	0.32	0.23	0.43	91.81	77.94	99.06	96.30	85.54	100.00
El Mafaza	0.40	0.31	0.53	83.73	70.17	93.22	96.77	91.04	100.00
Basunda	0.38	0.26	0.65	92.81	82.28	99.12	96.17	86.97	100.00
Western Galabat	0.39	0.27	0.58	89.92	78.37	97.44	96.53	89.84	100.00
Eastern Galabat	0.36	0.26	0.50	89.82	79.13	97.71	95.30	88.02	99.82
Al-Gadarif State	0.42	0.25	0.59	84.74	73.28	96.20	94.61	87.00	99.99
Sheikan	0.60	0.44	0.80	75.00	64.69	83.77	88.51	80.12	94.97
Um Rawaba	0.89	0.64	1.17	62.89	48.62	77.07	71.74	57.07	83.13
Um Dam Haj Ahmed	1.02	0.67	1.53	53.52	39.30	69.45	74.29	58.76	87.13
El Rahad	0.80	0.58	1.11	55.61	39.49	70.34	78.87	64.70	90.51
Bara	1.01	0.69	1.45	43.77	29.87	60.95	68.45	52.09	83.71
Gharb Bara	1.16	0.92	1.48	22.91	11.25	37.54	62.27	42.62	79.75
Soudari	1.21	0.83	1.83	47.26	33.69	59.98	65.18	49.98	79.01
Gebrat El Sheikh	1.85	1.38	2.61	34.27	21.37	44.94	56.81	42.32	67.25
North Kordofan State	1.00	0.63	1.37	54.84	41.22	68.46	73.30	60.59	86.00
Kadugli	0.52	0.42	0.63	74.79	64.61	83.19	96.09	92.16	98.59
Reif Shargi	0.47	0.29	0.84	86.48	72.53	94.95	93.89	80.41	99.79
Dilling	0.56	0.41	0.84	74.52	60.14	85.84	92.06	78.64	98.10
El Quoz	0.80	0.48	1.28	60.77	43.34	78.22	85.28	67.75	97.72
Habila	0.53	0.34	1.03	75.86	54.98	90.82	88.85	76.44	97.05
Abassiya	1.17	0.78	1.62	39.52	21.77	59.78	66.21	49.19	83.99
El Rashad	1.51	0.86	2.33	43.04	17.73	67.06	58.48	35.86	81.57
Abu Jubaiha	1.21	0.79	2.01	54.51	40.99	66.45	65.24	49.80	80.13
El Tadamon	1.01	0.62	1.49	52.34	32.56	72.91	69.91	51.81	88.44
Talodi	2.09	1.10	3.02	9.29	1.42	22.47	28.78	2.08	72.34

TABLE 95: Time to health facility by locality and state

Location	Time to Health Facility (hours)			Time to Health Facility < 30 minutes %			Time to Health Facility < 1 hour %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ghadeer	0.48	0.23	1.13	85.28	62.26	98.41	88.96	65.97	100.00
El Leri	1.40	0.95	2.07	37.29	20.13	56.45	58.56	42.02	75.48
Abu Karshola	1.18	0.69	1.80	44.99	24.25	68.28	70.89	48.40	89.94
Delami	2.21	0.37	4.54	61.39	30.45	96.88	72.47	33.20	100.00
South Kordofan State	0.98	0.50	1.46	57.47	39.22	75.72	75.27	57.63	92.92
Abu Zabad	0.58	0.37	0.82	74.75	54.93	93.52	89.67	75.74	97.47
ElKhiwai	0.76	0.53	1.14	56.85	30.56	77.74	90.79	75.40	99.17
Ghubaish	1.62	1.10	2.21	41.10	19.70	60.23	53.48	34.06	71.62
El Nuhud	1.73	1.23	2.29	29.00	13.61	45.17	46.91	33.59	62.61
El Idia	2.18	1.38	3.17	40.08	18.82	61.89	49.40	28.71	67.60
Wad Benda	2.13	1.27	3.21	42.12	21.91	64.08	52.30	35.70	72.01
Lagawa	1.06	0.55	1.72	64.66	48.21	79.24	78.02	55.45	92.14
Elsunut	1.71	0.96	2.70	44.18	20.17	65.30	57.96	35.61	80.26
Keilik	0.52	0.36	1.41	83.50	71.71	92.29	88.19	77.31	94.38
Es Salam	1.12	0.79	1.80	51.67	37.91	64.70	73.31	59.30	85.46
Babanusa	3.47	2.25	4.61	30.24	18.74	39.67	46.78	30.80	61.65
Abyei	1.19	0.72	1.70	72.29	54.44	86.67	75.13	59.95	88.04
El Dibab	1.49	0.35	2.80	60.42	16.04	95.34	67.36	21.28	100.00
El Meiram	0.70	0.27	1.76	87.08	59.43	100.00	89.27	64.93	100.00
West Kordofan State	1.55	0.86	2.25	49.77	31.22	68.32	62.82	45.17	80.46
El Fasher	0.55	0.43	0.72	74.91	65.47	82.49	93.34	86.46	97.61
Tawila	1.81	1.34	2.35	16.63	8.89	25.86	59.91	42.91	80.20
Melit	1.64	0.95	2.42	46.94	23.11	70.84	51.50	28.40	72.70
Um Kadada	1.48	0.99	2.02	49.93	34.94	67.96	57.12	39.79	76.14
Kebkabiya	0.93	0.51	1.64	63.94	45.27	82.44	73.83	56.43	90.13
Kutum	1.48	0.86	2.43	51.14	33.84	68.24	62.82	46.08	77.59
El Mahalha	1.16	0.32	3.01	71.43	51.02	87.34	82.32	59.17	98.40
Saraf Omra	1.60	1.06	2.22	39.61	18.67	60.26	50.35	31.54	70.81
El Serief	1.27	0.96	1.56	45.09	32.82	56.72	65.04	53.67	76.57
Dar Elsalam	1.00	0.51	1.66	60.00	37.74	84.53	72.14	48.08	92.51
Kelemando	1.27	0.86	1.71	46.61	28.84	64.05	63.54	44.00	80.36
El Tawisha	0.59	0.36	0.94	79.34	63.57	91.67	87.02	72.26	96.42
Um Baru	2.55	1.61	4.03	25.00	9.52	38.27	29.13	11.45	47.38
El Lait	1.42	0.72	2.45	51.21	30.71	73.48	59.65	36.86	76.50
ELkuma	0.78	0.40	1.39	61.82	22.60	95.35	83.66	43.25	100.00

TABLE 95: Time to health facility by locality and state

Location	Time to Health Facility (hours)			Time to Health Facility < 30 minutes %			Time to Health Facility < 1 hour %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Tina	1.50	1.22	1.78	0.00	0.00	0.00	44.44	11.11	77.78
Kernoi	2.01	1.52	2.47	16.18	6.89	28.91	34.27	14.95	54.31
North Darfur State	1.21	0.57	1.86	53.13	35.79	70.46	67.84	49.64	86.04
Nyala South	0.44	0.36	0.54	78.89	65.91	87.55	98.89	96.83	100.00
Nyala North	0.47	0.25	0.73	81.68	55.71	100.00	96.85	89.04	100.00
Es Salam	1.05	0.73	1.43	48.16	31.04	65.64	62.32	41.50	80.80
El Wihda	1.72	1.26	2.21	15.50	1.32	37.22	27.86	5.60	56.19
Mershing	0.92	0.62	1.44	57.89	37.09	75.17	82.74	65.32	94.84
Beliel	0.85	0.58	1.16	64.39	53.04	74.85	84.01	72.42	93.62
Nitega	0.84	0.38	1.41	71.29	50.86	90.28	78.39	52.87	98.76
Sharg El Jabal (accessible parts)	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	1.91	1.45	2.32	18.76	6.37	32.78	36.60	19.50	54.48
Shattaya	1.31	0.88	1.85	39.22	15.67	61.60	58.19	36.52	77.24
Buram	1.30	0.77	2.03	41.67	18.38	65.55	71.48	50.71	88.82
Gereida	0.74	0.37	1.21	71.78	50.82	89.61	79.49	60.08	95.97
El Sunta	1.82	1.47	2.19	9.83	2.56	20.20	34.38	17.61	52.57
El Radoum	1.62	1.03	2.21	37.45	18.00	61.28	46.17	24.41	66.66
Tulus	0.57	0.33	0.90	58.70	36.65	90.81	98.70	70.95	100.00
Damso	0.97	0.56	1.41	51.03	28.61	77.56	66.21	36.90	89.20
Ed Elfursan	1.28	0.88	1.74	44.18	23.85	61.02	60.99	39.65	83.40
Kubum	1.07	0.76	1.42	46.61	26.88	61.31	63.74	46.24	77.88
Kateila	1.47	0.93	1.91	44.20	22.43	66.28	55.01	29.36	75.73
Rehaid Elbirdi	1.67	1.04	2.30	42.39	19.69	66.51	49.13	29.13	70.62
Um Dafoug	2.26	1.72	2.76	10.05	2.45	22.50	30.75	12.44	56.76
South Darfur State	1.13	0.69	1.57	49.83	30.10	69.57	68.46	50.71	86.21
Abu Jabra	1.25	0.87	1.62	51.93	38.21	67.58	65.29	49.11	81.78
Abu Karinka	1.40	0.83	2.11	45.75	24.67	65.96	54.32	32.98	74.36
Bahr El Arab	2.04	1.34	3.39	10.76	1.27	25.65	43.12	21.55	64.01
Adila	1.25	0.78	1.70	50.59	29.19	75.01	54.65	32.17	76.19
Ed Dain	0.53	0.46	0.76	73.54	65.95	80.72	96.58	88.77	98.94
Assalaya	2.55	2.08	3.01	11.08	1.95	25.57	18.92	8.49	33.55
El Firdous	1.64	1.45	1.80	6.32	0.92	17.62	30.07	17.62	45.50
Shia-ria	1.48	1.03	2.08	25.64	12.25	41.80	47.87	26.46	65.98
Yassin	1.85	1.40	2.33	36.46	22.24	50.69	49.82	34.35	68.38
East Darfur State	1.60	1.00	2.20	33.76	18.09	49.43	50.39	32.75	68.02
El Geneina	0.63	0.47	0.87	66.03	51.41	77.44	87.51	77.11	96.65

TABLE 95: Time to health facility by locality and state

Location	Time to Health Facility (hours)			Time to Health Facility < 30 minutes %			Time to Health Facility < 1 hour %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Habila	1.52	1.14	1.81	17.92	6.10	36.37	40.75	23.21	59.21
Kulbus	1.55	0.90	2.48	44.10	26.77	66.33	60.44	37.57	83.69
Beida	0.98	0.70	1.31	40.67	24.82	57.99	79.90	63.60	94.63
Foro Baranga	0.96	0.60	1.41	47.67	32.37	61.16	75.99	57.75	91.13
Kereneik	0.65	0.47	1.03	64.26	51.82	76.22	96.43	85.86	100.00
Sirba	1.72	1.20	2.34	29.54	14.76	45.88	46.01	27.13	62.41
Jebel Moon	1.48	0.87	2.09	33.93	15.13	58.66	51.52	31.77	74.62
West Darfur State	1.09	0.63	1.55	48.80	32.45	65.16	72.36	56.33	88.39
Zalingi	1.09	0.85	1.37	43.69	33.02	54.40	65.71	53.43	76.41
Wadi Salih	1.15	0.84	1.45	33.64	16.42	52.37	66.36	48.52	82.80
Mukjar	1.77	1.26	2.41	22.87	6.12	44.15	40.31	20.47	64.70
Central Jebel Mara	0.69	0.29	1.17	71.22	37.62	95.69	77.70	45.88	100.00
North Jebel Mara	2.65	2.04	3.76	0.68	0.00	3.64	3.29	0.00	8.49
Bendasi	3.04	1.88	4.75	19.74	5.94	37.09	24.67	5.95	46.43
Nertiti	0.82	0.66	1.08	50.71	41.98	57.76	80.61	67.27	89.69
Azum	0.50	0.24	0.96	81.68	56.80	98.71	89.80	69.33	99.74
Um Dukhun	1.18	0.91	1.73	38.55	24.58	52.77	57.62	44.05	71.82
Central Darfur State	1.45	0.82	2.08	39.04	20.93	57.14	54.61	36.53	72.70

Spatial distribution of time to health facility

FIGURE 309: Household: Time to health facility in hours (mean) (raster)

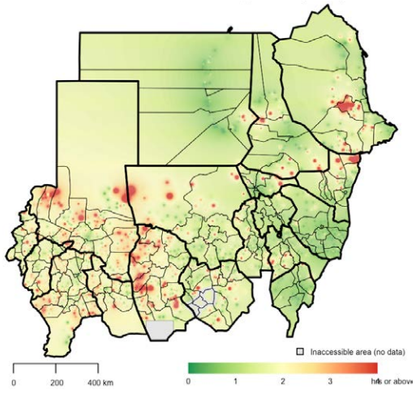


FIGURE 310: Household: Time to health facility in hours (mean)

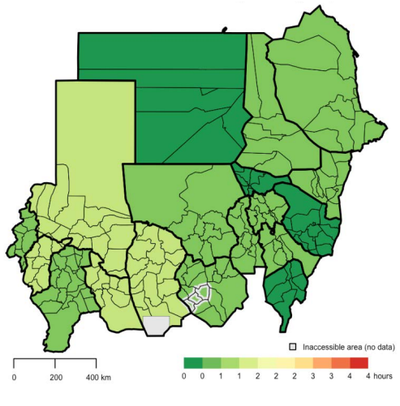


FIGURE 311:
Household: Time to health facility < 30 minutes (raster)

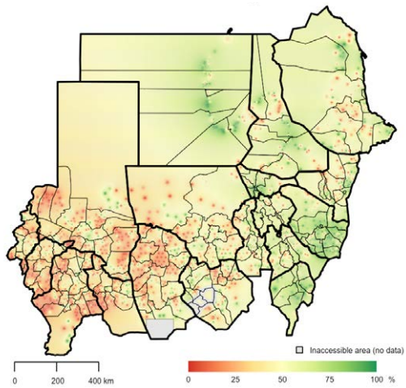


FIGURE 312:
Household: Time to health facility < 30 minutes

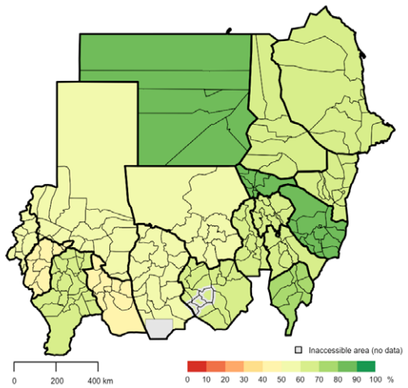


FIGURE 313:
Household: Time to health facility < 1 hour

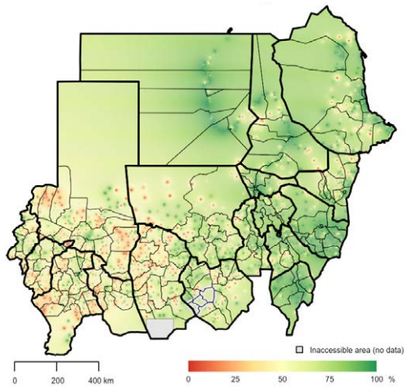
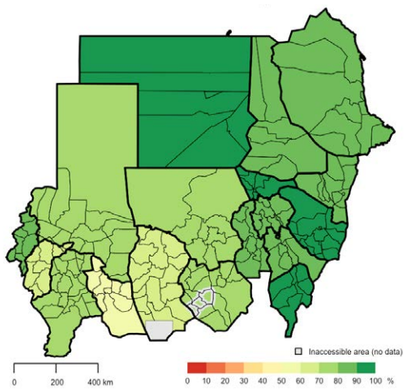


FIGURE 314:
Household: Time to health facility < 1 hour



3.17 Coping strategies index (CSI)

CSI score average results

The coping strategies index (CSI) is a measure of what people do when they lack adequate access to food and includes behaviors such as changing the diet of the household, rationing food, borrowing food or money from others on a short-term basis and other actions. The total score is calculated based on the frequency of each identified coping behavior and weighted according to severity of the action. Thus, a higher score means that the household was more food insecure and had to engage in more frequent and extreme coping mechanisms.

Households that reported practicing no coping strategies in the month before the survey was high at 81.7 per cent (95 per cent CI: 74.8-88.7). Low and moderate CSI scores were low at 2.2 per cent (95 per cent CI: 0.01-4.5) and 3.4 per cent (95 per cent CI: 0.7-6.1) respectively. A high CSI score was relatively higher at 12.21 per cent (95 per cent CI: 6.3-18.1). Across the states, East Darfur had the highest proportion of households that reported practicing several coping strategies *(see Figure 316)*.

Across localities, there was generally low intra-state and inter-state variability in households that reported practicing several coping strategies, except for Central, East, North and South Darfur, where there was high variability. Some localities within these states had much higher rates of households that reported practicing several coping strategies *(see Figure 315)*.

Table 96 and Table 97 present results by locality, by state and at the national level for the coping strategies index (CSI) score.

FIGURE 315: Box plot of locality results for CSI

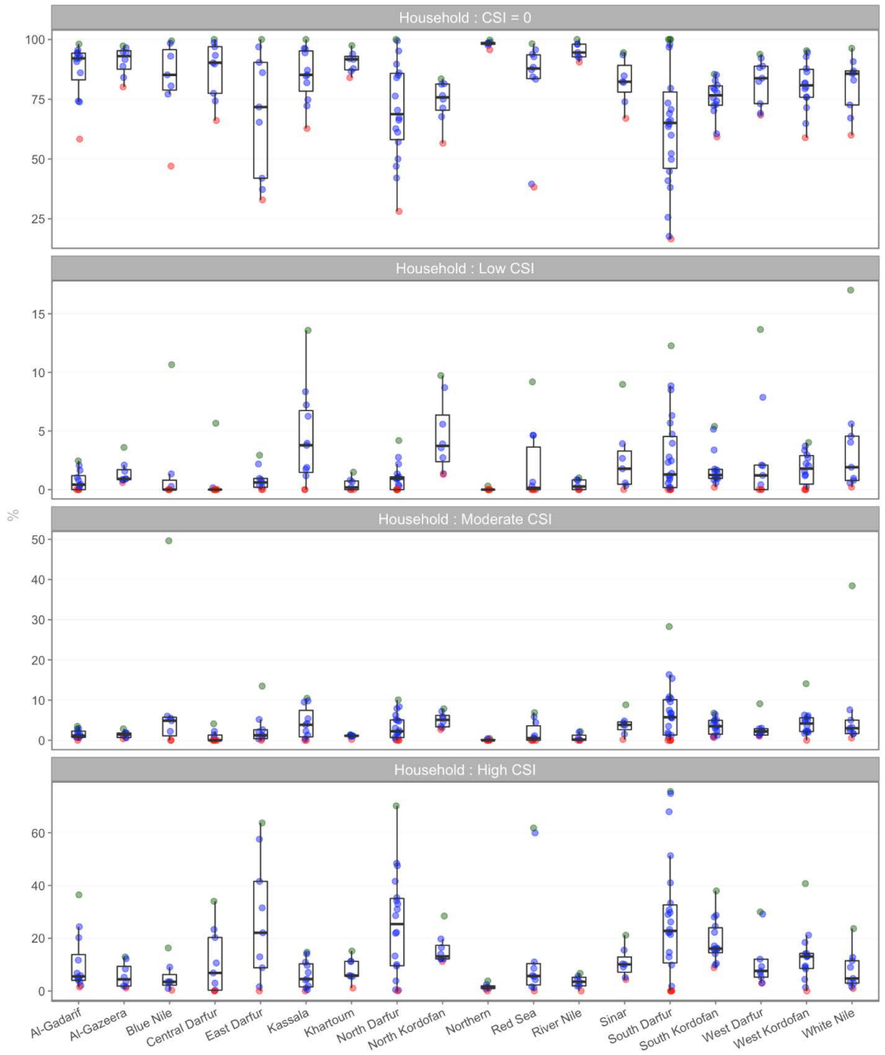


FIGURE 316: Box plot of state results for CSI

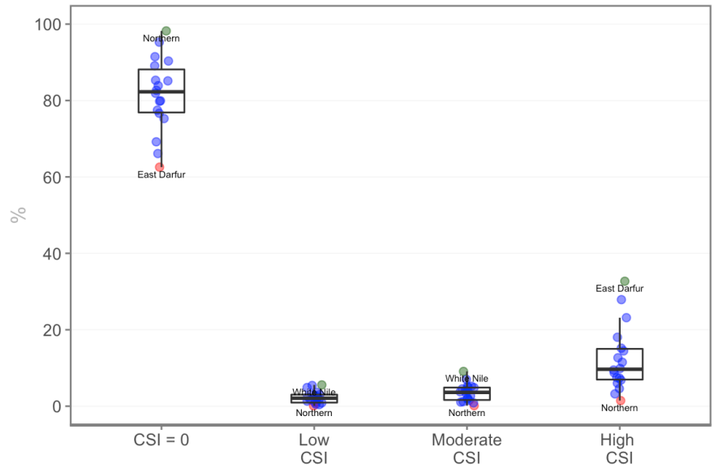


TABLE 96: CSI by state and national

State	CSI = 0 %			Low CSI %			Moderate CSI %			High CSI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	85.14	77.55	92.73	1.13	0.01	2.87	1.89	0.00	3.79	11.51	4.90	18.12
Al-Gazeera	90.34	84.94	95.73	1.78	0.01	3.86	1.53	0.01	3.11	6.03	1.84	10.21
Blue Nile	85.30	79.57	91.04	3.01	0.01	6.32	7.01	4.28	9.73	4.60	1.06	8.14
Central Darfur	89.08	81.54	96.62	0.87	0.01	2.57	1.20	0.01	2.93	8.74	1.16	16.32
East Darfur	62.56	52.84	72.29	0.87	0.01	2.32	3.76	0.96	6.57	32.70	23.37	42.03
Kassala	81.89	74.88	88.91	5.42	2.21	8.63	5.21	1.71	8.72	7.36	3.27	11.45
Khartoum	91.47	86.22	96.73	0.42	0.01	1.40	1.08	0.01	2.57	6.83	2.12	11.54
North Darfur	66.12	58.07	74.16	1.32	0.01	2.73	4.52	1.73	7.32	27.88	18.90	36.86
North Kordofan	75.28	66.49	84.07	4.88	1.21	8.56	5.19	1.68	8.71	14.46	7.97	20.95
Northern	98.21	96.24	99.99	0.09	0.01	0.48	0.12	0.01	0.58	1.46	0.01	3.27
Red Sea	79.93	71.92	87.93	2.46	0.01	5.27	2.15	0.01	6.00	15.18	8.87	21.48
River Nile	95.27	91.58	98.95	0.51	0.01	1.41	0.87	0.01	2.05	3.22	0.01	6.49
Sennar	82.67	76.72	88.62	3.03	0.78	5.28	4.13	1.49	6.78	9.87	5.32	14.42
South Darfur	69.19	61.09	77.30	2.38	0.05	4.71	4.86	1.85	7.87	23.16	16.17	30.15
South Kordofan	76.67	67.76	85.58	1.67	0.01	3.58	3.47	0.43	6.51	18.04	9.93	26.14
West Darfur	83.89	77.53	90.24	3.62	0.28	6.96	2.70	0.42	4.98	9.46	4.12	14.80
West Kordofan	79.80	71.08	88.52	2.45	0.09	4.81	4.88	1.57	8.18	12.67	6.46	18.89
White Nile	77.47	70.97	83.97	5.57	2.22	8.91	9.10	4.59	13.60	7.50	3.49	11.52
Sudan	81.99	75.03	88.95	2.19	0.01	4.47	3.37	0.69	6.05	12.21	6.32	18.10

TABLE 97: CSI by locality and by state

Location	CSI = 0 %			Low CSI %			Moderate CSI %			High CSI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	98.41	97.20	99.56	0.29	0.00	1.34	0.44	0.00	1.31	0.60	0.00	1.78
El Golid	97.33	93.71	99.58	0.00	0.00	1.01	0.00	0.00	0.62	2.45	0.40	5.53
Merwoe	99.00	96.33	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	3.27
El Daba	98.38	96.50	99.77	0.00	0.00	0.00	0.00	0.00	0.93	1.40	0.00	3.48
Halfa	97.30	95.24	98.95	0.00	0.00	0.00	0.00	0.00	0.75	2.66	1.18	4.75
Delgo	99.81	99.00	100.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.79
El Burgaig	96.21	93.40	98.35	0.00	0.00	0.86	0.40	0.00	1.19	3.16	1.42	5.91
Northern State	98.21	96.24	99.99	0.09	0.01	0.48	0.12	0.01	0.58	1.46	0.01	3.27
El Matama	91.49	84.78	96.29	0.43	0.00	1.51	1.90	0.42	3.67	6.08	2.32	12.03
Shendi	92.49	87.21	96.73	1.16	0.15	3.35	2.24	0.63	4.38	3.77	1.36	7.46
Abu Hamad	97.89	95.35	99.57	0.00	0.00	0.67	0.00	0.00	0.47	2.10	0.45	4.63
Barbar	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
El Damar	95.13	90.70	97.94	0.70	0.09	1.54	0.45	0.08	1.19	3.81	1.13	8.37
Atbara	98.88	97.01	100.00	0.00	0.00	0.29	0.00	0.00	0.00	1.14	0.14	2.84
El Buhaira	90.63	85.13	94.30	0.53	0.00	1.75	0.83	0.13	2.07	8.31	4.93	12.10
River Nile State	95.27	91.58	98.95	0.51	0.01	1.41	0.87	0.01	2.05	3.22	0.01	6.49
Khartoum	93.90	90.58	96.63	0.00	0.00	0.80	0.38	0.00	1.54	5.60	3.04	8.91
Bahri	86.74	81.37	92.24	0.82	0.00	2.61	1.12	0.00	3.13	10.61	5.95	17.48
Um Durman	84.13	77.43	89.94	0.00	0.00	0.00	0.93	0.15	2.34	15.03	9.04	21.50
Um Bada	91.33	85.30	96.19	0.00	0.00	0.00	0.78	0.00	2.48	7.35	3.50	14.26
Jebel Awlia	92.49	87.58	96.60	0.50	0.00	1.62	1.30	0.00	3.86	5.50	2.79	9.72
Sharg Elneel	97.49	94.88	99.26	0.18	0.00	1.07	1.12	0.18	2.63	0.94	0.00	2.91
Karrari	90.32	82.57	95.82	1.51	0.19	3.37	1.31	0.19	3.01	6.17	1.32	12.99
Khartoum State	91.47	86.22	96.73	0.42	0.01	1.40	1.08	0.01	2.57	6.83	2.12	11.54
Greater Medani	80.16	75.00	85.20	3.57	1.71	5.78	2.97	1.31	5.07	13.07	9.51	16.83
Ganub Elgazira	84.53	77.79	90.82	1.77	0.00	5.98	1.75	0.41	3.77	12.13	6.11	18.15
El Hassahisa	95.14	92.34	97.41	1.30	0.19	3.09	0.93	0.18	2.21	2.38	0.93	4.01
El Kamlin	91.76	84.70	97.56	0.61	0.00	1.99	1.62	0.20	4.56	5.85	1.99	12.03
Sharg El Gezira	97.12	93.72	99.45	0.86	0.00	2.05	0.38	0.00	1.78	1.31	0.00	4.09
Um Elqura	93.69	88.77	97.35	0.81	0.00	2.81	0.80	0.00	2.11	4.53	1.65	9.09
El Manaqil	92.74	87.64	97.46	2.59	0.36	5.38	1.64	0.36	3.68	2.56	0.36	6.74
El Qurashi	89.23	82.75	94.10	1.06	0.00	2.60	1.66	0.43	3.88	7.87	3.61	13.88
Al-Gazeera State	90.34	84.94	95.73	1.78	0.01	3.86	1.53	0.01	3.11	6.03	1.84	10.21
Sennar	82.03	76.45	86.82	4.42	2.50	6.39	4.41	2.52	7.01	9.20	6.33	12.60
Sharg Sennar	93.60	89.43	96.82	0.35	0.00	1.38	1.59	0.34	3.95	4.17	1.71	7.24
Sinja	66.84	60.02	73.83	9.02	5.13	13.10	8.79	6.02	12.15	14.77	10.19	21.55

TABLE 97: CSI by locality and by state

Location	CSI = 0 %			Low CSI %			Moderate CSI %			High CSI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Hujar	74.25	65.22	84.24	2.07	0.00	4.86	3.89	1.44	6.91	18.86	10.44	29.11
El Dali	94.60	91.00	97.74	0.00	0.00	0.38	0.76	0.00	2.41	4.50	2.09	7.40
Es Suki	82.66	77.17	87.11	2.24	0.40	5.16	4.04	1.38	7.43	10.56	7.31	14.96
Ed Dinder	84.99	78.88	91.94	2.04	0.22	4.82	3.96	1.32	7.23	8.70	4.79	13.10
Sennar State	82.67	76.72	88.62	3.03	0.78	5.28	4.13	1.49	6.78	9.87	5.32	14.42
Ed Damazine	91.78	85.08	96.81	2.52	0.68	4.79	2.31	0.68	4.48	3.39	1.05	6.13
El Tadamon	47.03	41.86	51.85	0.00	0.00	0.00	49.39	44.44	55.01	3.45	1.48	5.96
El Roseiris	80.87	72.21	87.62	10.57	5.26	17.49	4.89	2.66	7.73	3.43	1.43	5.86
Baw	99.41	97.85	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.00	2.38
Geisan	77.25	68.09	86.20	0.53	0.00	1.85	6.12	2.89	9.89	16.05	9.16	23.69
El Kurmuk	98.37	94.60	100.00	0.00	0.00	1.94	0.00	0.00	1.47	1.20	0.00	3.89
Wad El Mahi	85.41	77.35	91.45	0.00	0.00	0.60	6.22	4.08	8.66	8.50	3.70	14.32
Blue Nile State	85.30	79.57	91.04	3.01	0.01	6.32	7.01	4.28	9.73	4.60	1.06	8.14
Kosti	66.62	59.67	73.80	16.52	10.07	22.39	3.07	1.50	5.16	13.16	8.84	18.38
Guli	76.08	68.43	84.34	0.76	0.00	2.08	3.58	1.53	6.83	19.20	11.23	27.36
Tendalti	84.84	79.63	90.22	6.17	3.33	9.36	4.59	2.24	7.94	4.07	1.58	7.89
Es Salam	87.25	82.94	90.97	0.79	0.00	2.31	0.59	0.00	2.08	11.29	7.84	15.08
Rabak	82.65	77.57	88.07	4.25	2.09	7.09	6.91	3.23	11.27	5.46	2.85	8.87
El Jabalain	82.58	75.42	88.97	3.08	0.77	6.94	3.42	0.95	6.60	10.52	5.46	16.02
El Diwaim	58.71	50.79	68.16	0.58	0.00	1.58	39.73	29.11	48.62	0.78	0.00	1.95
Um Rimta	96.32	94.28	98.17	0.21	0.00	1.25	1.67	0.21	3.65	1.61	0.49	3.26
El Gitaina	92.29	86.78	96.18	3.26	1.20	6.46	1.23	0.00	3.41	2.84	0.81	5.17
White Nile State	77.47	70.97	83.97	5.57	2.22	8.91	9.10	4.59	13.60	7.50	3.49	11.52
Port Sudan	91.86	87.86	95.83	0.00	0.00	0.36	0.00	0.00	0.91	7.88	3.99	12.62
Swakin	96.93	93.09	99.19	0.00	0.00	0.00	0.00	0.00	0.63	3.01	0.96	6.62
El Gonob Welawlaib	80.21	67.41	91.97	0.95	0.00	2.72	3.93	1.08	7.68	15.28	6.34	25.99
Sinkat	39.59	31.21	48.44	0.00	0.00	0.00	1.16	0.20	2.45	58.63	50.49	68.91
Haya	85.23	77.32	92.53	8.68	3.57	14.08	5.51	1.09	12.04	0.00	0.00	1.25
Dordieb	93.00	88.40	96.86	4.59	1.91	7.80	0.63	0.00	2.27	1.55	0.21	3.37
Tokar	97.70	94.70	99.59	0.00	0.00	0.75	0.38	0.00	1.21	1.71	0.19	3.99
Agig	37.42	30.05	46.96	0.43	0.00	1.54	0.00	0.00	0.00	61.59	49.46	70.37
Gabaot Elma-aadin	83.17	78.12	87.64	4.65	2.03	7.65	6.58	3.60	9.98	5.28	2.58	8.37
Halaeeb (accessible parts)	83.87	71.54	92.08	0.00	0.00	0.00	0.00	0.00	5.67	14.29	5.00	25.52
Red Sea State	79.93	71.92	87.93	2.46	0.01	5.27	2.15	0.01	6.00	15.18	8.87	21.48
Kassala Town	71.62	61.74	81.66	7.28	3.94	11.57	10.70	6.40	16.43	9.66	5.68	14.36

TABLE 97: CSI by locality and by state

Location	CSI = 0 %			Low CSI %			Moderate CSI %			High CSI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi Kassla	75.94	70.89	80.82	6.30	3.33	10.15	4.03	2.06	6.49	13.40	9.23	17.79
Rural Western Kassala	82.27	75.03	88.49	8.45	5.33	11.83	4.63	1.89	9.32	4.22	1.72	8.46
New Halfa	82.95	76.01	88.69	4.73	2.32	7.76	4.34	1.99	7.49	8.09	4.60	12.34
Refi Nahr Atbara	96.01	93.47	98.11	1.89	0.41	4.20	0.00	0.00	0.64	2.10	0.84	3.67
Rural Khashm Elgirba	99.79	98.53	100.00	0.00	0.00	0.84	0.00	0.00	0.00	0.00	0.00	1.26
Rural Wad Elhilaiw	86.77	78.29	92.71	0.00	0.00	0.00	3.78	0.48	7.84	10.04	6.58	15.01
Rural Aroma	97.36	94.74	99.33	1.27	0.00	3.58	0.85	0.00	2.52	0.42	0.00	1.58
Refi North Delta	84.44	79.64	88.58	3.73	1.08	7.20	9.91	6.39	13.81	1.58	0.25	3.42
Refi Hamashkureib	93.67	87.94	98.01	1.19	0.20	2.57	0.42	0.00	2.14	4.55	0.43	9.80
Rural Telkok	62.41	52.40	72.14	14.29	8.69	19.86	10.05	5.65	14.25	13.41	7.98	19.92
Kassala State	81.89	74.88	88.91	5.42	2.21	8.63	5.21	1.71	8.72	7.36	3.27	11.45
Gedaref Town	76.25	67.85	83.52	1.80	0.36	3.79	2.44	0.69	5.17	19.22	12.43	27.86
Middle Geddaref	92.26	86.37	96.33	0.00	0.00	0.00	2.73	0.89	5.09	4.97	1.85	9.84
Elbutana	92.19	87.76	95.73	2.23	0.21	4.42	0.94	0.00	1.97	4.88	2.27	8.30
El Fashaga	93.30	83.65	97.89	0.00	0.00	0.00	0.60	0.00	1.92	5.66	1.51	15.32
El Rahad	95.71	90.98	99.01	0.81	0.00	2.97	1.20	0.00	2.85	2.22	0.00	5.72
Gala-a El Nahal	92.63	86.29	97.19	0.48	0.00	1.92	0.93	0.00	2.13	5.65	1.19	12.39
El Fao	92.87	89.51	95.94	0.36	0.00	1.64	2.69	0.90	5.17	3.89	1.73	6.83
El Qureisha	81.03	66.28	93.87	0.00	0.00	1.17	2.34	0.58	5.32	15.58	5.53	28.81
El Mafaza	90.98	86.35	95.02	4.06	0.81	8.40	1.72	0.19	4.14	2.73	0.54	5.33
Basunda	73.55	61.24	83.93	0.42	0.00	1.48	1.48	0.45	3.10	24.42	14.98	35.67
Western Galabat	97.96	94.39	99.81	0.38	0.00	1.38	0.00	0.00	0.77	1.34	0.00	4.96
Eastern Galabat	59.22	46.30	70.88	0.90	0.17	2.13	3.37	1.56	5.73	36.36	26.54	47.73
Al-Gadarif State	85.14	77.55	92.73	1.13	0.01	2.87	1.89	0.00	3.79	11.51	4.90	18.12
Sheikan	81.71	75.59	86.81	3.87	1.94	5.95	4.22	2.43	6.39	10.31	6.75	14.61
Um Rawaba	71.52	64.10	78.68	8.61	4.51	12.92	5.19	3.06	7.79	14.61	7.99	21.78
Um Dam Haj Ahmed	59.47	47.71	74.34	9.46	3.82	16.60	5.99	3.05	9.83	23.27	12.14	33.01
El Rahad	73.66	67.00	82.01	4.43	1.79	8.23	5.76	2.72	10.07	15.50	10.34	22.08
Bara	69.75	60.39	79.73	3.83	2.07	6.05	6.45	3.04	10.41	19.38	12.67	27.10
Gharb Bara	83.91	72.50	92.75	3.18	0.18	7.92	2.71	0.54	6.14	10.19	5.26	16.13
Soudari	83.64	76.70	89.47	1.96	0.44	3.89	2.76	0.89	5.33	11.56	6.75	17.75
Gebrat El Sheikh	63.18	52.22	75.22	4.91	1.47	10.87	8.89	4.50	15.89	21.08	13.53	28.91
North Kordofan State	75.28	66.49	84.07	4.88	1.21	8.56	5.19	1.68	8.71	14.46	7.97	20.95

TABLE 97: CSI by locality and by state

Location	CSI = 0 %			Low CSI %			Moderate CSI %			High CSI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kadugli	62.49	53.38	70.27	4.96	2.17	7.73	6.63	4.38	9.29	26.14	19.07	35.65
Reif Shargi	62.58	52.71	72.75	0.64	0.00	2.81	0.83	0.00	2.89	34.63	24.42	45.53
Dilling	75.00	62.28	86.44	2.47	0.42	5.20	2.46	0.36	6.20	19.92	9.48	32.37
El Quoz	74.18	65.56	82.75	1.56	0.19	4.00	5.18	2.31	8.53	19.07	11.82	28.63
Habila	84.75	77.10	91.64	1.46	0.00	3.78	3.28	0.58	7.42	9.65	5.49	15.17
Abassiya	80.12	72.06	87.51	1.76	0.39	3.92	4.76	2.16	8.57	13.41	7.80	19.30
El Rashad	85.83	77.36	93.30	1.57	0.21	3.87	3.58	0.43	8.17	8.78	3.73	14.35
Abu Jubaiha	81.31	74.30	88.87	0.94	0.19	2.49	2.08	0.77	3.40	15.98	9.78	22.42
El Tadamon	80.78	70.90	89.37	0.39	0.00	1.52	4.64	1.74	9.52	13.63	7.52	21.21
Talodi	71.01	59.57	83.45	2.14	0.00	7.09	0.71	0.00	3.57	26.24	11.50	40.14
Ghadeer	79.65	72.26	87.54	1.07	0.00	3.03	2.55	0.67	4.96	16.29	9.15	23.84
El Leri	77.71	68.98	85.43	1.02	0.00	3.11	4.64	2.71	7.68	15.94	10.19	23.21
Abu Karshola	76.11	69.17	81.88	0.84	0.00	2.55	1.27	0.00	3.74	21.80	15.62	28.63
Delami	83.00	75.58	90.69	1.57	0.00	3.94	5.12	2.02	8.27	10.32	5.11	16.67
South Kordofan State	76.67	67.76	85.58	1.67	0.01	3.58	3.47	0.43	6.51	18.04	9.93	26.14
Abu Zabad	77.91	69.78	85.95	3.21	1.36	5.31	5.68	2.79	8.80	13.09	7.99	18.48
ElKhiwai	76.31	66.45	84.07	3.35	0.83	7.36	6.09	2.94	10.69	14.08	8.48	21.34
Ghubaish	76.83	68.50	84.39	1.65	0.20	3.89	4.85	2.49	7.85	16.34	9.70	24.52
El Nuhud	75.50	65.55	84.29	3.75	1.13	7.38	8.25	4.42	13.07	12.16	7.26	18.09
El Idia	87.72	80.61	93.77	1.74	0.56	3.53	2.45	0.00	6.11	8.17	5.13	12.50
Wad Benda	82.12	74.22	88.89	3.08	1.05	5.60	5.03	1.96	8.61	10.07	5.16	16.03
Lagawa	81.97	73.89	89.05	2.76	0.54	5.85	2.21	0.60	4.61	13.28	7.41	19.49
Elsunut	93.48	88.48	96.77	0.25	0.00	1.67	1.70	0.47	3.39	4.23	1.16	8.73
Keilik	65.37	59.61	71.22	0.00	0.00	1.24	13.61	9.87	17.86	20.74	16.91	25.00
Es Salam	70.31	61.88	77.27	4.77	2.38	8.01	5.94	3.52	8.73	18.18	13.30	23.16
Babanusa	94.60	91.93	97.11	1.39	0.21	3.26	2.00	0.69	3.96	1.74	0.21	4.26
Abyei	86.88	79.32	94.08	2.17	0.78	3.87	1.70	0.00	4.22	9.85	3.69	17.12
El Dibab	83.42	71.47	93.81	2.67	0.52	6.74	5.38	1.55	11.47	7.22	1.04	15.62
El Meiram	59.80	47.42	77.20	0.00	0.00	0.00	0.00	0.00	0.00	40.65	23.58	53.73
West Kordofan State	79.80	71.08	88.52	2.45	0.09	4.81	4.88	1.57	8.18	12.67	6.46	18.89
El Fasher	71.57	65.80	77.07	1.76	0.95	2.79	5.69	4.03	7.55	21.20	15.15	27.26
Tawila	66.73	62.16	71.25	0.00	0.00	0.73	0.73	0.00	1.81	32.25	26.92	37.57
Melit	85.45	80.23	90.58	3.14	1.40	5.28	1.95	0.20	4.33	8.88	4.09	16.25
Um Kadada	86.21	83.19	89.12	0.00	0.00	0.60	9.79	7.58	12.62	3.96	1.85	6.63
Kebkabiya	50.60	43.58	58.81	0.25	0.00	1.71	8.44	4.92	12.95	40.34	30.47	48.88
Kutum	69.83	63.60	76.83	0.77	0.18	2.21	6.37	3.99	9.16	22.75	17.03	28.22

TABLE 97: CSI by locality and by state

Location	CSI = 0 %			Low CSI %			Moderate CSI %			High CSI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Mahalha	94.55	91.14	97.27	4.74	1.97	7.70	0.00	0.00	0.92	0.26	0.00	2.75
Saraf Omra	40.56	25.05	57.21	0.94	0.00	2.31	7.81	3.70	12.66	51.42	32.90	71.07
El Serief	20.19	13.24	27.35	0.00	0.00	0.00	1.31	0.37	2.80	78.49	71.37	85.38
Dar Elsalam	70.98	62.28	78.85	0.45	0.00	1.79	2.23	0.67	4.72	26.34	19.42	33.93
Kelemando	83.73	76.31	91.50	1.03	0.16	2.31	2.37	0.89	4.54	12.22	6.66	19.61
El Tawisha	89.57	86.75	92.95	0.31	0.00	0.94	0.32	0.00	1.38	9.71	6.40	13.37
Um Baru	54.48	46.30	66.86	0.49	0.00	3.54	3.37	0.00	9.10	40.17	25.69	49.27
El Lait	66.19	59.77	71.94	1.36	0.38	3.05	3.14	1.43	5.67	28.91	22.63	35.13
ELkuma	99.41	96.00	100.00	0.00	0.00	0.00	0.00	0.00	2.05	0.00	0.00	2.78
El Tina	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kernoi	51.87	46.11	59.36	2.34	0.80	4.17	5.10	3.30	7.52	40.22	33.14	45.86
North Darfur State	66.12	58.07	74.16	1.32	0.01	2.73	4.52	1.73	7.32	27.88	18.90	36.86
Nyala South	67.44	59.90	75.01	0.00	0.00	0.00	1.20	0.26	2.51	31.28	23.88	39.49
Nyala North	72.54	55.20	90.12	1.03	0.00	5.80	0.00	0.00	3.57	25.64	10.93	39.40
Es Salam	59.60	53.63	68.77	0.59	0.00	1.63	5.43	2.78	8.71	34.63	26.75	40.27
El Wihda	53.64	47.45	60.21	8.93	4.28	13.38	14.02	9.48	19.88	23.22	17.44	28.32
Mershing	64.54	60.42	70.56	2.36	0.86	4.49	10.90	7.89	14.18	21.78	16.79	26.20
Beliel	17.40	11.51	23.54	0.19	0.00	0.61	7.31	4.37	10.10	75.23	67.47	80.67
Nitega	46.53	39.27	55.73	3.69	1.55	6.24	9.84	5.98	13.91	39.95	32.66	46.44
Sharg El Jabal (accessible parts)	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	49.13	42.40	55.68	2.64	1.21	4.75	16.28	10.36	22.71	31.54	24.66	38.81
Shattaya	43.72	34.78	55.17	8.04	3.70	14.10	26.62	21.28	31.84	21.22	15.24	26.92
Buram	25.57	20.96	31.53	0.52	0.00	1.55	5.68	3.40	9.18	67.86	61.97	72.75
Gereida	37.75	27.33	49.70	1.43	0.37	2.98	10.22	6.73	13.86	51.08	37.54	62.48
El Sunta	67.05	58.51	74.72	4.64	1.74	8.48	5.40	3.10	8.76	22.32	16.19	30.31
El Radoum	65.06	57.32	73.33	11.82	8.09	16.05	11.36	7.53	15.81	12.00	7.00	18.67
Tulus	96.82	91.86	100.00	1.12	0.00	4.04	1.10	0.00	6.14	0.00	0.00	2.23
Damso	100.00	98.96	100.00	0.00	0.00	1.38	0.00	0.00	0.00	0.00	0.00	0.00
Ed Elfursan	97.85	95.39	99.58	0.00	0.00	0.75	0.00	0.00	0.83	1.79	0.42	3.90
Kubum	66.36	59.86	72.25	2.23	0.77	4.40	1.98	0.70	3.62	29.73	22.85	35.77
Kateila	100.00	99.51	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56
Rehaid Elbirdi	80.73	74.16	86.48	5.93	3.42	9.97	3.29	1.51	5.81	9.74	5.80	14.43
Um Dafoug	73.38	65.47	81.38	4.49	1.76	7.80	6.72	3.67	11.20	14.86	8.43	22.46
South Darfur State	69.19	61.09	77.30	2.38	0.05	4.71	4.86	1.85	7.87	23.16	16.17	30.15
Abu Jabra	90.12	83.09	96.14	0.21	0.00	1.43	0.41	0.00	1.66	8.60	3.65	15.89

TABLE 97: CSI by locality and by state

Location	CSI = 0 %			Low CSI %			Moderate CSI %			High CSI %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Karinka	33.12	25.84	42.69	0.85	0.00	2.32	6.87	3.81	10.30	59.70	50.20	66.53
Bahr El Arab	66.25	53.94	81.40	1.24	0.00	4.05	0.96	0.00	3.45	31.33	16.76	43.00
Adila	41.85	34.43	51.22	2.96	1.31	5.02	13.29	8.83	20.09	42.20	33.68	49.85
Ed Dain	84.84	78.98	88.97	0.52	0.00	1.69	0.72	0.00	4.29	13.53	9.62	18.61
Assalaya	32.88	19.77	46.18	0.82	0.00	2.08	2.03	0.32	4.88	63.97	48.60	76.22
El Firdous	95.66	92.27	98.85	0.00	0.00	0.00	1.36	0.00	3.62	2.95	0.68	6.73
Shia-ria	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yassin	71.66	62.77	79.35	0.32	0.00	1.11	5.31	2.99	8.18	22.17	14.62	31.02
East Darfur State	62.56	52.84	72.29	0.87	0.01	2.32	3.76	0.96	6.57	32.70	23.37	42.03
El Geneina	88.83	84.06	93.37	3.47	1.77	6.06	2.08	0.56	4.18	5.41	2.52	9.63
Habila	73.39	60.16	84.27	13.03	4.10	23.24	7.04	2.66	12.74	6.69	2.47	12.09
Kulbus	84.88	79.53	89.41	7.17	3.18	11.25	3.00	1.54	5.15	5.03	1.26	9.73
Beida	92.07	86.55	95.90	0.00	0.00	0.00	1.28	0.16	2.83	6.69	3.93	11.12
Foro Baranga	77.99	70.01	85.57	4.47	0.89	10.75	3.45	1.72	5.65	13.79	7.55	19.72
Kereneik	69.96	63.65	76.13	1.05	0.21	2.63	3.20	1.26	5.34	26.00	19.87	32.69
Sirba	88.37	80.57	93.64	0.18	0.00	0.89	1.88	0.57	3.45	9.11	3.82	16.84
Jebel Moon	86.65	79.97	93.28	1.75	0.00	5.52	2.30	0.64	5.07	8.97	4.18	15.66
West Darfur State	83.89	77.53	90.24	3.62	0.28	6.96	2.70	0.42	4.98	9.46	4.12	14.80
Zalingi	76.86	70.10	82.86	0.48	0.08	1.00	2.61	0.90	5.01	19.81	14.63	25.12
Wadi Salih	90.00	83.27	95.30	5.50	1.81	10.04	3.96	1.52	7.25	0.30	0.00	1.21
Mukjar	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central Jebel Mara	78.63	62.12	91.58	0.00	0.00	0.00	0.69	0.00	3.62	20.14	7.65	36.71
North Jebel Mara	94.04	88.88	98.58	0.00	0.00	0.00	0.00	0.00	0.00	5.59	1.45	11.04
Bendasi	98.37	96.65	99.67	0.00	0.00	0.00	1.32	0.00	3.01	0.00	0.00	1.09
Nertiti	67.96	60.54	76.31	0.00	0.00	0.00	0.19	0.00	0.93	32.10	23.44	40.10
Azum	96.75	93.04	99.25	0.00	0.00	0.00	0.00	0.00	1.01	3.26	0.74	7.11
Um Dukhun	90.17	80.48	97.44	0.00	0.00	0.00	0.00	0.00	0.73	9.91	3.38	19.11
Central Darfur State	89.08	81.54	96.62	0.87	0.01	2.57	1.20	0.01	2.93	8.74	1.16	16.32

Spatial distribution of CSI scores

There was a fairly evenly spread throughout the country of a low proportion of households that reported practicing several coping strategies, with small areas of moderate to high proportions of household with a high CSI score in Red Sea state, East Darfur state, South Darfur and North Darfur states *(see Figure 319, Figure 321 Figure 339 and Figure 323).*

FIGURE 317:
Household: CSI = 0 (raster)

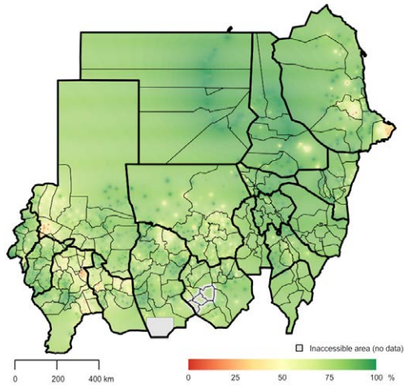


FIGURE 318:
Household: CSI = 0

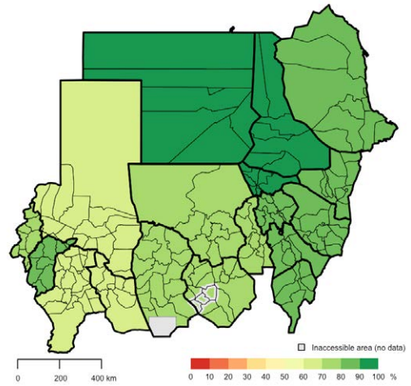


FIGURE 319:
Household: Low CSI (raster)

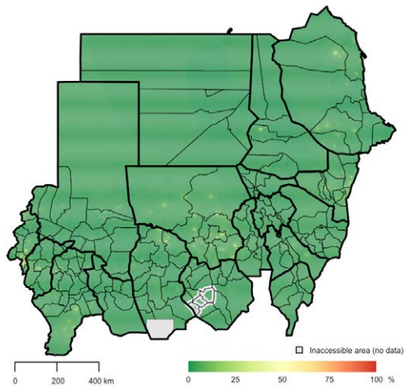


FIGURE 320:
Household: Low CSI

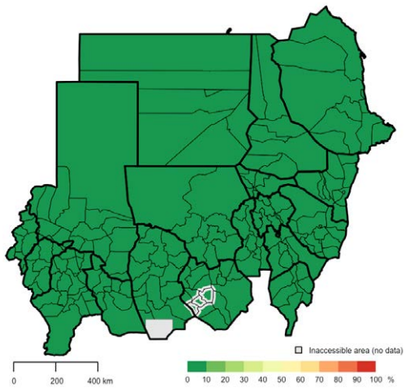


FIGURE 321:
Household: Moderate CSI (raster)

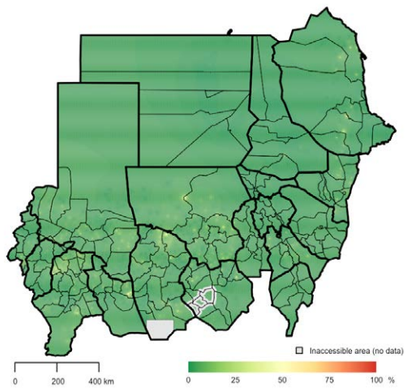


FIGURE 322:
Household: Moderate CSI

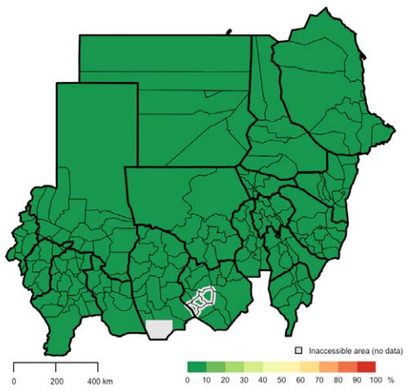


FIGURE 323:
Household: High CSI (raster)

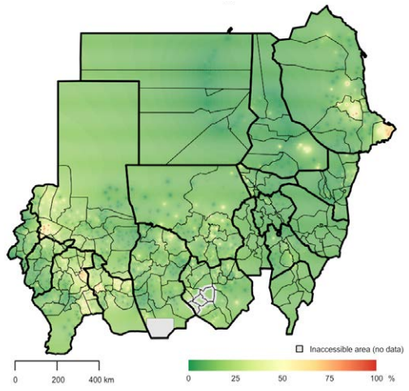
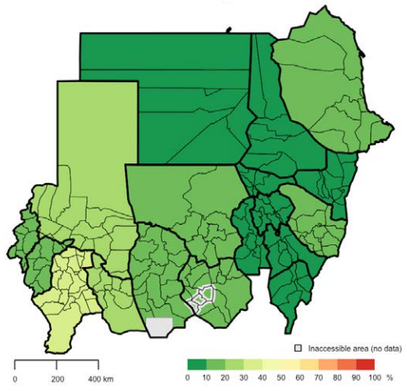


FIGURE 324:
Household: High CSI



3.18 Health and nutrition information awareness and access

Carers' awareness and knowledge of health and nutrition programs are the building blocks of program coverage. Appropriate and timely health and nutrition messages use the most appropriate and acceptable medium to enhance this awareness and knowledge. For the S3M II survey, indicators of nutrition program awareness included knowledge of the growth monitoring program (GMP) and the community-based management of acute malnutrition (CMAM) program.

GMP awareness average results

Awareness of the GMP was found to be only 42.2 per cent (95 per cent CI: 32.4-52.1 percent) for the whole country. North Kordofan had the highest proportion of carers who were aware of the GMP at 69.6 per cent (95 per cent CI: 59.8-79.4), and Central Darfur had the lowest proportion at 16.8 per cent (95 per cent CI: 9.0-24.6 *(see Figure 325)*. A majority of localities (72.4 had fewer than 50 per cent of carers who were aware of the GMP. None of the carers surveyed in Central Jebel Mara locality in Central Darfur state and Sharg El Jabal (accessible parts) locality in South Darfur state knew about the GMP at all *(see Figure 326)*.

CMAM Awareness Average Results

Carer awareness of the CMAM program was 53.7 per cent (95 per cent CI: 43.4-64.1) for the whole country. Blue Nile had the highest proportion of carers who were aware of CMAM at 85.3 per cent (95 per cent CI: 75.9-94.7), and River Nile had the lowest level of awareness at 37.1 per cent (95 per cent CI: 29.2-45.0) *(see Figure 325)*. About 41.6 per cent of the localities in Sudan had fewer than 50 per cent of carers who were aware of CMAM, still a considerable proportion. None of the surveyed carers in Sharg El Jabal (accessible parts) locality in South Darfur state knew about CMAM, while all of the surveyed carers in Central Jabal Mara in Central Darfur knew about it *(see Figure 326)*.

Carer receipt of health messages average results

The proportion of caregivers who reported receiving health and nutrition messages was 46.8 per cent (95 per cent CI: 35.8-57.7 for the whole country.

Kassala state had the highest proportion of carers who received health and nutrition messages at 75.5 per cent (95 per cent CI: 68-82.9, while Central Darfur state had the lowest at 24 per cent (95 per cent CI: 12.4-35.6 *(see Figure 341)*. Only 34.6 per cent of the localities in Sudan had more than 50 per cent carers who received health and nutrition messages. Some localities such as Bahr El Arab in East Darfur state and Sharg El Jabal (accessible parts) locality in South Darfur state had very few or no carers who received any health and nutrition messages.

FIGURE 325: Box plot of state results of awareness of GMP, CMAM program and receipt of health and nutrition messages

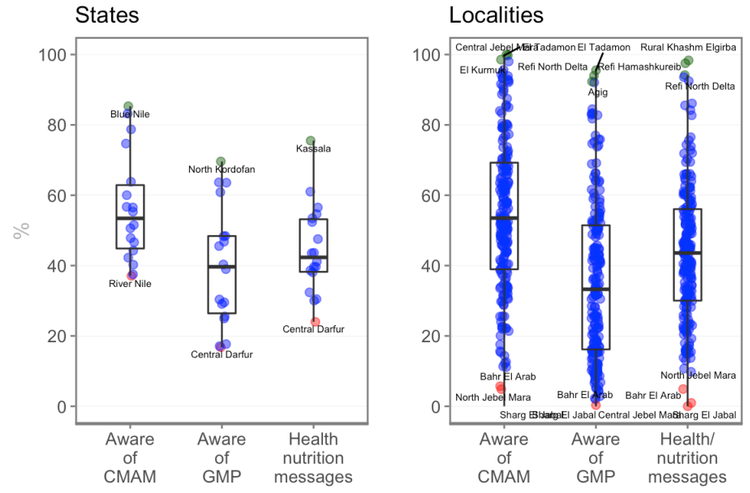


FIGURE 326: Awareness of health and nutrition programs and messages by state and national

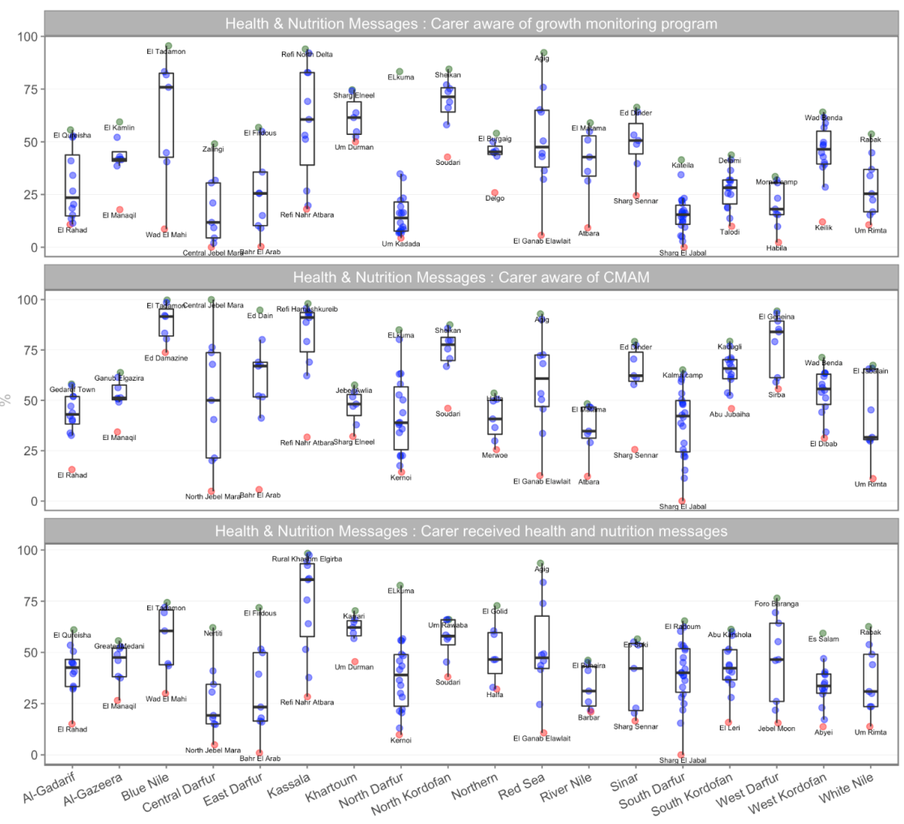


TABLE 98: Awareness of health and nutrition programs and messages by state and national

State	Awareness of Growth Monitoring Program %			Awareness of CMAM %			Received Health and Nutrition Messages %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	29.56	18.34	40.78	42.25	30.97	53.53	39.63	28.74	50.51
Al-Gazeera	38.99	29.14	48.84	51.55	40.11	62.99	43.63	33.40	53.85
Blue Nile	60.87	49.42	72.31	85.30	75.94	94.67	53.43	43.15	63.71
Central Darfur	16.79	9.00	24.59	50.61	38.93	62.29	24.00	12.40	35.61
East Darfur	24.94	17.54	32.33	56.54	47.59	65.48	30.04	21.73	38.36
Kassala	63.56	53.32	73.80	83.19	75.94	90.45	75.51	68.15	82.88
Khartoum	63.67	53.61	73.73	47.85	37.42	58.28	61.00	50.38	71.62
North Darfur	17.68	8.70	26.67	44.27	33.83	54.72	38.09	26.75	49.42
North Kordofan	69.60	59.83	79.38	74.69	65.72	83.65	56.52	45.23	67.82
Northern	46.80	37.62	55.99	40.25	31.92	48.58	54.63	44.87	64.39
Red Sea	48.43	35.16	61.69	56.71	44.15	69.27	52.39	35.44	69.34
River Nile	40.33	30.06	50.60	37.08	29.15	45.02	30.47	21.74	39.20
Sennar	48.32	36.07	60.57	60.03	49.22	70.84	41.15	31.78	50.52
South Darfur	17.10	10.28	23.92	37.51	26.15	48.87	39.66	26.77	52.56
South Kordofan	29.08	20.26	37.89	63.83	52.06	75.59	43.53	31.09	55.97
West Darfur	25.54	15.47	35.62	78.73	69.72	87.75	47.54	36.46	58.61
West Kordofan	45.55	34.48	56.61	55.32	44.71	65.93	32.38	22.22	42.55
White Nile	30.38	22.05	38.71	46.62	37.65	55.58	38.63	28.86	48.39
Sudan	42.23	32.36	52.09	53.74	43.38	64.09	46.75	35.81	57.68

TABLE 99: Awareness of health and nutrition programs and messages by locality and by state

Location	Awareness of Growth Monitoring Program %			Awareness of CMAM %			Received Health and Nutrition Messages %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	52.71	44.25	60.57	51.32	41.46	60.69	63.89	55.49	71.25
El Golid	44.81	36.67	53.26	36.80	29.64	43.71	72.90	59.36	84.65
Merwoe	45.78	36.27	56.64	24.58	15.79	36.30	46.82	35.69	58.36
El Daba	43.49	33.87	50.62	41.03	34.12	46.88	59.15	51.15	65.81
Halfa	46.46	40.53	52.05	49.10	42.17	55.41	33.33	23.66	43.61
Delgo	25.51	18.98	31.65	32.86	25.50	40.57	32.24	24.16	41.78

TABLE 99: Awareness of health and nutrition programs and messages by locality and by state

Location	Awareness of Growth Monitoring Program %			Awareness of CMAM %			Received Health and Nutrition Messages %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Burgaig	55.15	44.35	66.39	50.51	40.72	58.67	47.86	39.04	56.25
Northern State	46.80	37.62	55.99	40.25	31.92	48.58	54.63	44.87	64.39
El Matama	52.60	40.51	65.24	44.64	34.83	55.03	35.55	24.67	46.60
Shendi	43.20	34.99	51.09	47.17	38.18	54.61	25.53	17.02	36.67
Abu Hamad	52.78	41.20	63.09	30.69	21.89	40.38	18.40	11.00	26.07
Barbar	37.17	28.92	48.31	34.72	28.00	43.83	20.10	12.47	27.35
El Damar	38.27	28.87	47.73	34.58	27.45	41.99	41.48	34.79	49.12
Atbara	14.79	10.05	21.38	18.95	13.56	26.05	28.18	19.86	37.14
El Buhaira	50.26	40.69	58.09	46.57	38.27	54.07	44.05	35.98	52.24
River Nile State	40.33	30.06	50.60	37.08	29.15	45.02	30.47	21.74	39.20
Khartoum	54.01	44.61	62.76	48.13	34.83	61.47	61.96	55.23	68.28
Bahri	63.64	52.32	73.83	36.88	28.63	43.88	64.18	53.52	73.75
Um Durman	50.50	41.92	58.14	52.58	44.32	61.28	45.21	37.32	53.33
Um Bada	64.08	51.52	78.53	56.85	41.51	71.07	60.58	45.30	76.20
Jebel Awlia	56.39	46.98	66.35	58.47	50.31	67.11	57.24	46.53	68.37
Sharg Elneel	74.71	65.15	82.57	31.36	24.30	38.76	65.44	58.07	74.29
Karrari	77.76	68.25	86.63	46.37	39.35	53.77	68.70	61.02	75.38
Khartoum State	63.67	53.61	73.73	47.85	37.42	58.28	61.00	50.38	71.62
Greater Medani	40.35	31.16	49.64	52.63	43.96	58.90	57.04	50.25	65.37
Ganub Elgazira	40.00	30.29	49.23	60.48	47.50	71.64	51.52	41.88	60.44
El Hassahisa	42.78	32.12	53.26	47.02	36.38	57.56	43.10	33.45	53.82
El Kamlin	59.01	46.69	69.91	52.28	45.73	59.08	49.49	36.63	63.70
Sharg El Gezira	40.95	29.62	52.22	50.19	37.64	62.73	37.18	27.08	47.41
Um Elqura	40.38	31.05	49.16	55.18	44.88	64.56	36.09	28.62	44.71
El Manaqil	21.34	14.74	29.06	43.72	29.78	56.58	34.10	22.10	45.20
El Qurashi	43.12	34.24	52.74	61.47	50.11	72.34	45.12	34.70	55.83
Al-Gazeera State	38.99	29.14	48.84	51.55	40.11	62.99	43.63	33.40	53.85
Sennar	39.42	33.88	44.61	61.29	55.48	65.63	53.15	44.59	60.75
Sharg Sennar	26.38	16.67	35.01	26.00	18.16	36.04	17.31	11.41	26.22
Sinja	63.66	56.30	69.94	76.64	71.22	82.45	53.92	46.73	62.31
Abu Hujar	57.91	37.98	77.96	64.42	45.50	80.98	45.26	29.74	61.67
El Dali	46.56	34.82	58.59	68.14	51.77	79.39	20.23	13.49	28.31
Es Suki	57.52	43.99	69.76	63.29	56.11	71.00	60.04	47.98	70.08

TABLE 99: Awareness of health and nutrition programs and messages by locality and by state

Location	Awareness of Growth Monitoring Program %			Awareness of CMAM %			Received Health and Nutrition Messages %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ed Dinder	60.95	42.63	77.08	76.64	58.07	90.95	24.44	14.95	35.07
Sennar State	48.32	36.07	60.57	60.03	49.22	70.84	41.15	31.78	50.52
Ed Damazine	46.92	37.02	57.43	77.51	71.11	83.84	38.84	31.30	46.30
El Tadamon	95.80	86.52	100.00	99.50	95.06	100.00	74.57	67.56	81.30
El Roseiris	81.99	70.59	89.71	81.83	73.53	89.29	59.91	51.06	68.61
Baw	76.76	56.60	92.37	75.00	54.27	92.96	67.94	48.22	82.64
Geisan	79.89	55.46	98.93	93.30	86.84	98.16	69.68	61.77	78.46
El Kurmuk	44.88	38.06	52.10	98.38	95.14	100.00	43.67	35.58	49.68
Wad El Mahi	8.48	3.16	14.03	87.78	78.59	94.50	38.25	26.69	50.02
Blue Nile State	60.87	49.42	72.31	85.30	75.94	94.67	53.43	43.15	63.71
Kosti	35.60	27.96	42.19	67.07	62.09	72.34	50.15	39.59	60.53
Guli	18.30	11.56	26.53	36.67	27.89	47.11	30.46	25.70	35.61
Tendalti	26.40	15.96	39.63	34.02	24.16	45.07	33.80	21.65	46.71
Es Salam	35.85	27.20	44.69	44.42	34.26	54.20	41.77	28.39	55.62
Rabak	53.25	43.33	63.01	67.10	56.47	76.31	65.66	54.60	76.38
El Jabalain	46.36	36.57	55.61	66.60	60.57	73.30	53.71	44.44	63.48
El Diwaim	16.27	10.33	23.06	30.86	20.90	45.83	22.42	14.81	31.92
Um Rimta	10.42	6.51	15.25	10.91	7.14	15.54	13.79	9.06	19.39
El Gitaina	21.10	14.60	28.97	26.83	19.10	35.72	21.26	11.25	30.03
White Nile State	30.38	22.05	38.71	46.62	37.65	55.58	38.63	28.86	48.39
Port Sudan	31.68	25.77	38.41	35.44	29.47	41.87	37.94	29.84	45.93
Swakin	53.06	46.35	60.23	52.72	46.65	58.94	50.94	43.34	58.19
El Gonob Welawlaib	32.78	20.16	45.02	45.58	30.24	61.65	44.98	27.62	60.47
Sinkat	65.31	50.93	77.99	69.01	53.06	79.43	45.13	30.28	60.40
Haya	36.25	20.75	50.19	44.72	29.69	59.32	44.95	29.03	59.21
Dordieb	44.87	26.89	62.40	53.96	35.94	74.18	26.23	13.34	40.33
Tokar	63.08	49.41	73.44	72.67	60.82	80.67	84.13	74.51	90.16
Agig	90.34	76.60	98.72	91.28	76.44	99.13	91.99	80.59	99.13
Gabaot Elma-aadin	77.74	69.46	83.67	91.07	83.27	95.94	75.09	66.91	84.30
Halaeeb (accessible parts)	56.96	32.20	73.28	82.69	62.95	94.18	57.14	12.12	86.93
Red Sea State	48.43	35.16	61.69	56.71	44.15	69.27	52.39	35.44	69.34
Kassala Town	82.15	73.63	89.51	89.33	80.75	95.31	85.83	77.77	92.13

TABLE 99: Awareness of health and nutrition programs and messages by locality and by state

Location	Awareness of Growth Monitoring Program %			Awareness of CMAM %			Received Health and Nutrition Messages %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi Kassla	80.17	69.86	88.47	90.44	83.86	95.76	83.40	76.38	90.33
Rural Western Kassala	24.08	13.00	38.92	64.39	54.65	73.53	35.78	26.80	43.43
New Halfa	54.07	45.94	63.43	73.11	65.64	79.24	54.75	45.10	65.60
Refi Nahr Atbara	17.86	11.54	24.37	31.09	21.37	40.56	26.89	18.06	36.16
Rural Khashm Elgirba	26.82	8.77	49.54	94.75	90.50	97.90	97.10	92.07	99.60
Rural Wad Elhilaiw	48.99	37.77	59.58	79.26	69.84	87.71	64.86	55.33	73.13
Rural Aroma	60.43	47.82	73.68	88.24	82.16	93.29	92.70	87.58	96.51
Refi North Delta	92.92	85.94	97.70	92.94	86.90	97.65	92.99	87.03	97.80
Refi Hamashkureib	92.35	85.37	97.51	98.03	94.32	100.00	97.71	94.84	99.80
Rural Telkok	60.25	49.27	71.83	91.41	77.80	99.53	74.64	63.77	83.46
Kassala State	63.56	53.32	73.80	83.19	75.94	90.45	75.51	68.15	82.88
Gedaref Town	47.08	35.33	59.38	55.75	44.63	65.79	42.08	30.21	54.90
Middle Geddaref	41.51	27.96	56.10	46.71	36.86	56.70	50.63	39.21	59.76
Elbutana	18.91	7.80	31.15	35.70	20.50	53.39	39.92	29.60	49.18
El Fashaga	51.89	37.04	67.40	51.42	37.26	68.03	53.24	41.91	65.28
El Rahad	9.33	2.78	19.67	13.55	4.44	24.96	13.29	4.97	25.14
Gala-a El Nahal	33.49	20.59	46.91	47.54	36.93	60.19	43.93	34.49	53.23
El Fao	12.46	8.41	17.93	33.74	25.26	41.75	34.68	27.88	40.68
El Qureisha	58.93	44.83	70.33	65.14	52.32	74.95	66.73	54.02	79.68
El Mafaza	31.55	16.00	45.64	40.00	25.88	52.67	42.31	27.10	55.33
Basunda	28.22	17.67	39.33	35.42	24.27	46.31	39.41	27.99	51.01
Western Galabat	17.85	9.14	30.10	43.24	34.56	54.14	31.95	24.00	40.05
Eastern Galabat	12.80	5.73	21.50	50.27	39.83	58.83	43.38	34.70	50.63
Al-Gadarif State	29.56	18.34	40.78	42.25	30.97	53.53	39.63	28.74	50.51
Sheikan	82.85	78.00	87.65	85.61	81.19	89.79	61.43	54.66	67.72
Um Rawaba	69.58	58.65	80.78	75.50	65.55	84.02	57.73	42.95	71.40
Um Dam Haj Ahmed	77.43	67.74	85.11	85.74	74.54	92.97	68.47	54.63	80.32
El Rahad	70.62	60.93	79.12	80.95	73.59	87.28	62.19	53.92	70.22
Bara	74.44	67.53	82.30	78.73	71.09	85.31	56.53	48.52	64.81
Gharb Bara	57.33	48.70	68.93	65.73	56.31	74.05	46.08	35.73	55.74
Soudari	42.64	29.37	56.14	46.71	31.26	59.74	38.47	26.34	50.40

TABLE 99: Awareness of health and nutrition programs and messages by locality and by state

Location	Awareness of Growth Monitoring Program %			Awareness of CMAM %			Received Health and Nutrition Messages %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Gebrat El Sheikh	67.09	53.87	81.76	73.27	62.07	83.27	61.52	45.80	75.72
North Kordofan State	69.60	59.83	79.38	74.69	65.72	83.65	56.52	45.23	67.82
Kadugli	44.21	37.86	50.18	79.54	72.75	84.23	57.41	50.73	64.75
Reif Shargi	28.60	19.05	39.79	69.79	63.58	75.17	41.72	32.32	50.55
Dilling	33.33	22.68	45.79	59.69	34.83	83.48	46.23	26.84	60.58
El Quoz	33.86	26.37	41.59	62.80	52.22	72.19	46.40	33.07	56.17
Habila	33.53	22.92	42.19	78.34	70.48	86.46	35.34	23.79	49.04
Abassiya	31.12	23.95	40.09	61.96	55.36	69.07	32.42	22.21	45.76
El Rashad	28.27	18.34	39.45	66.86	58.03	77.29	39.11	25.92	55.17
Abu Jubaiha	22.35	13.26	33.42	53.17	44.28	63.82	39.77	30.18	48.78
El Tadamon	27.31	18.18	36.92	60.50	52.04	68.21	49.43	33.55	67.58
Talodi	9.79	4.25	21.90	69.93	59.28	79.73	57.75	42.86	72.92
Ghadeer	18.00	11.31	27.21	52.36	42.85	62.22	27.95	19.11	37.45
El Leri	13.81	9.55	20.04	60.45	47.85	68.95	15.81	9.91	23.57
Abu Karshola	31.05	23.21	39.21	70.00	59.24	79.60	59.14	47.11	69.82
Delami	43.31	28.27	57.90	76.98	62.48	87.83	50.00	35.27	66.94
South Kordofan State	29.08	20.26	37.89	63.83	52.06	75.59	43.53	31.09	55.97
Abu Zabad	44.25	33.13	59.53	51.87	41.93	63.50	35.43	23.47	49.22
ElKhiwai	37.87	30.49	44.17	44.17	34.01	53.89	35.50	28.27	42.59
Ghubaish	44.11	32.60	56.61	50.74	39.13	60.23	28.09	18.61	37.82
El Nuhud	45.41	36.90	54.69	64.84	57.80	71.81	29.79	22.56	38.22
El Idia	44.97	36.13	54.14	54.87	43.90	64.81	38.79	29.87	48.72
Wad Benda	62.33	50.76	73.65	69.70	61.30	77.53	29.82	21.24	38.45
Lagawa	38.21	29.22	47.30	63.66	50.93	75.81	29.17	19.18	37.91
Elsunut	44.69	27.82	63.13	47.71	31.41	65.21	38.58	22.94	54.10
Keilik	12.26	8.74	16.67	34.20	28.42	39.45	22.33	15.62	29.67
Es Salam	62.66	52.12	72.47	64.53	53.61	72.63	60.06	49.54	69.85
Babanusa	56.30	46.62	64.69	59.41	49.03	68.58	37.07	27.87	45.46
Abyei	39.85	25.24	52.23	46.51	36.87	54.84	13.37	8.22	19.28
El Dibab	17.01	4.83	29.24	19.89	6.45	32.48	10.00	1.72	19.05
El Meiram	57.41	42.36	71.57	59.06	42.21	74.29	47.06	32.48	59.28

TABLE 99: Awareness of health and nutrition programs and messages by locality and by state

Location	Awareness of Growth Monitoring Program %			Awareness of CMAM %			Received Health and Nutrition Messages %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
West Kordofan State	45.55	34.48	56.61	55.32	44.71	65.93	32.38	22.22	42.55
El Fasher	23.12	17.50	28.38	63.06	58.00	68.92	52.21	46.75	57.55
Tawila	7.82	2.08	17.80	25.30	13.75	36.91	34.17	16.05	54.39
Melit	5.47	1.80	11.41	20.59	12.21	30.91	28.51	17.28	42.87
Um Kadada	4.36	1.71	7.26	80.05	69.57	87.04	49.46	39.24	59.79
Kebkabiya	34.71	28.00	42.23	35.04	27.90	43.70	37.16	29.56	44.20
Kutum	16.73	12.15	21.76	64.72	56.73	72.18	47.25	34.23	60.47
El Mahalha	9.31	4.57	14.50	17.97	9.49	26.70	30.05	15.73	42.90
Saraf Omra	15.31	7.54	24.63	42.61	30.71	55.69	20.14	8.21	32.94
El Serief	9.53	4.28	18.07	48.41	38.42	56.81	10.78	5.76	16.36
Dar Elsalam	4.73	1.90	7.98	27.06	15.95	38.67	48.51	37.79	57.97
Kelemando	17.83	11.73	24.48	40.80	32.92	48.11	57.58	47.60	65.79
El Tawisha	9.68	5.73	13.69	57.69	51.58	63.83	55.34	49.63	62.08
Um Baru	5.77	0.47	18.37	25.85	16.30	38.01	19.24	10.44	28.05
El Lait	20.92	12.49	28.92	38.64	28.59	48.38	41.83	31.98	53.57
ELkuma	81.46	62.09	90.31	83.33	59.46	92.77	80.99	63.54	92.11
El Tina	22.22	0.00	44.44	22.22	0.00	55.56	22.22	0.00	45.00
Kernoi	9.77	5.67	16.42	15.00	10.19	20.48	12.04	8.14	17.34
North Darfur State	17.68	8.70	26.67	44.27	33.83	54.72	38.09	26.75	49.42
Nyala South	17.89	13.18	23.18	40.52	35.99	46.56	44.77	35.91	53.10
Nyala North	14.29	3.87	29.66	40.94	19.43	65.76	46.48	17.82	75.59
Es Salam	15.19	10.48	20.47	61.87	52.49	69.37	52.81	45.27	59.36
El Wihda	6.29	2.64	11.86	23.55	14.92	33.96	31.79	23.14	39.44
Mershing	12.21	4.18	19.09	47.35	35.05	58.10	37.87	29.20	45.57
Beliel	17.04	12.11	22.92	63.70	57.51	69.66	60.70	54.21	66.47
Nitega	23.21	14.46	31.92	59.90	51.85	67.01	43.32	35.11	50.88
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	9.79	6.14	13.86	37.46	31.10	43.09	24.96	18.01	32.28
Shattaya	11.33	7.19	15.17	46.07	38.57	51.68	35.84	26.86	45.39
Buram	2.96	1.39	4.97	28.86	19.02	39.49	36.80	25.54	48.26
Gereida	20.87	12.35	28.39	50.39	37.21	63.02	53.44	39.40	64.97

TABLE 99: Awareness of health and nutrition programs and messages by locality and by state

Location	Awareness of Growth Monitoring Program %			Awareness of CMAM %			Received Health and Nutrition Messages %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Sunta	20.96	15.91	27.13	53.98	43.66	64.88	41.48	33.13	49.86
El Radoum	21.72	15.07	27.81	23.99	17.95	30.56	65.99	55.57	75.25
Tulus	10.26	4.15	16.40	25.47	16.02	41.44	31.11	21.00	46.93
Damso	4.76	1.74	8.82	10.10	4.50	17.91	33.22	19.71	54.80
Ed Elfursan	34.70	26.87	42.38	39.01	31.31	46.14	39.34	31.44	46.55
Kubum	15.29	11.71	18.76	43.30	35.94	50.39	39.47	31.14	46.85
Kateila	41.88	30.80	51.82	53.44	44.60	65.28	54.35	43.77	64.48
Rehaid Elbirdi	22.58	16.83	27.91	21.63	16.69	27.52	21.91	15.94	27.04
Um Dafoug	15.50	9.65	22.48	15.46	10.07	22.20	15.50	9.65	21.71
South Darfur State	17.10	10.28	23.92	37.51	26.15	48.87	39.66	26.77	52.56
Abu Jabra	51.19	40.42	61.54	63.32	52.23	75.62	44.33	32.02	55.91
Abu Karinka	38.59	29.67	48.16	74.45	63.94	82.00	45.69	36.32	55.30
Bahr El Arab	0.32	0.00	1.89	5.92	2.84	9.35	0.96	0.00	2.80
Adila	25.46	19.35	32.35	52.20	41.23	63.30	23.31	16.31	31.83
Ed Dain	34.57	27.71	41.52	91.86	86.55	96.64	50.91	42.43	59.11
Assalaya	14.57	8.59	20.34	67.86	61.52	74.33	16.16	10.00	22.93
El Firdous	50.22	39.57	60.97	71.82	63.94	81.66	66.52	57.97	74.48
Shia-ria	10.41	6.15	15.11	54.72	44.32	67.77	13.92	6.63	23.45
Yassin	9.76	6.39	14.54	44.54	31.82	58.68	21.16	9.02	33.22
East Darfur State	24.94	17.54	32.33	56.54	47.59	65.48	30.04	21.73	38.36
El Geneina	36.47	26.31	47.19	91.48	87.14	95.16	57.13	47.24	66.12
Habila	2.63	0.20	5.79	56.31	47.76	65.10	17.37	9.03	26.35
Kulbus	24.17	14.50	33.41	84.31	72.53	93.08	56.13	39.86	71.46
Beida	9.42	3.03	17.96	82.40	71.46	90.94	46.63	39.36	53.87
Foro Baranga	15.86	8.69	25.45	75.93	63.32	86.18	63.67	48.30	78.04
Kereneik	28.92	23.14	34.44	87.21	80.61	92.10	62.76	55.50	69.01
Sirba	20.18	9.66	32.08	56.67	42.86	68.95	27.27	18.38	36.60
Jebel Moon	30.99	16.31	48.81	64.07	52.53	73.97	24.82	14.02	36.40
West Darfur State	25.54	15.47	35.62	78.73	69.72	87.75	47.54	36.46	58.61
Zalingi	45.64	36.47	54.94	74.64	66.17	82.60	46.76	39.86	52.21
Wadi Salih	30.59	18.60	42.43	67.60	52.25	80.91	30.14	18.72	41.10
Mukjar	10.36	0.00	21.22	21.35	4.97	41.44	13.30	0.87	32.67
Central Jebel Mara	0.00	0.00	0.00	100.00	100.00	100.00	19.57	4.26	36.26

TABLE 99: Awareness of health and nutrition programs and messages by locality and by state

Location	Awareness of Growth Monitoring Program %			Awareness of CMAM %			Received Health and Nutrition Messages %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
North Jebel Mara	4.00	0.00	11.36	4.79	0.00	12.60	4.96	0.67	12.17
Bendasi	1.79	0.34	3.93	47.54	37.70	57.20	14.47	6.02	25.77
Nertiti	22.13	14.80	29.49	75.59	69.28	81.60	67.82	56.76	75.92
Azum	30.28	21.22	40.26	39.39	27.60	50.39	31.46	22.01	43.09
Um Dukhun	11.32	4.85	19.89	18.47	8.12	29.38	16.60	8.50	27.41
Central Darfur State	16.79	9.00	24.59	50.61	38.93	62.29	24.00	12.40	35.61

Spatial distribution of health and nutrition information awareness

There was a decreasing spatial trend of GMP awareness from the eastern to the western part of Sudan, with pockets of high awareness in the southern areas of North Kordofan and Red Sea states, northern areas of Blue Nile and Kassala statse, and central areas of Northern and Sennar states. The Darfur states and Sennar had a near-even spatial spread of low awareness of GMP *(see Figure 327)*.

There was a decreasing spatial trend of CMAM awareness from the north-east, east, south and central parts of Sudan toward the west and southwest of the country, with pockets of low awareness in the most western and southern areas of the Darfurs, central areas of Kassala state, central areas of Khartoum and Red Sea states, and northern areas of North Kordofan and White Nile states *(see Figure 329)*.

The spatial distribution of coverage of health and nutrition messages followed a similar spatial trend to that of GMP awareness *(see Figure 331)*.

FIGURE 327:
Carer aware of growth monitoring program (raster)

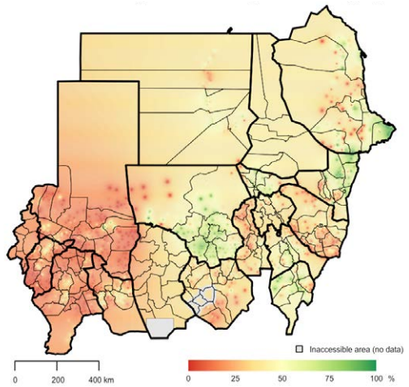


FIGURE 328:
Carer aware of growth monitoring program

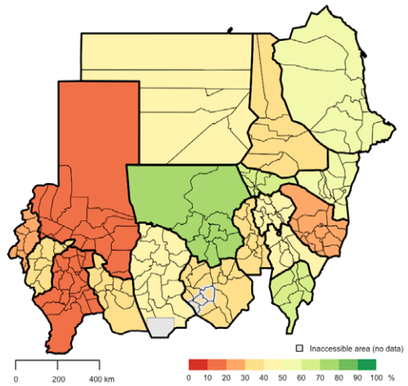


FIGURE 329:
Carer aware of CMAM (raster)

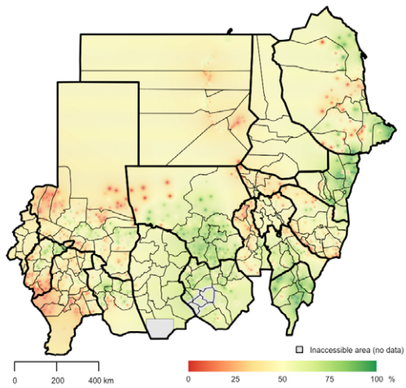


FIGURE 330:
Carer aware of CMAM (raster)

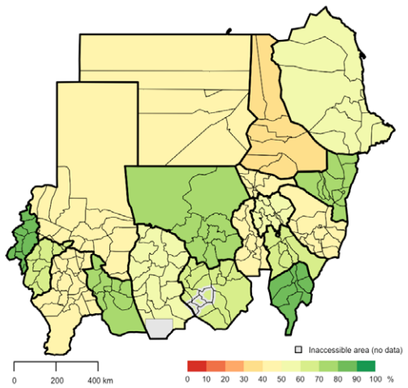


FIGURE 331:
Carer received health and nutrition messages (raster)

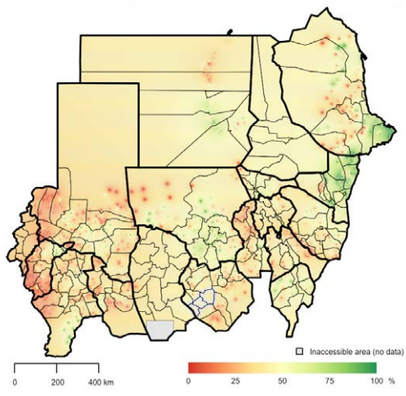
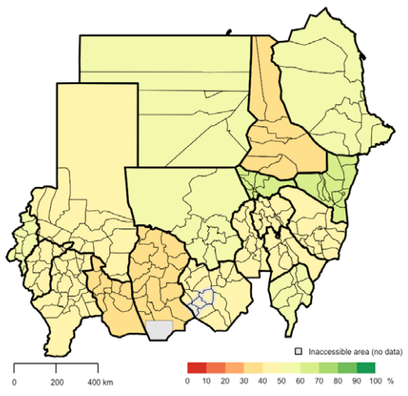


FIGURE 332:
Carer received health and nutrition messages



3.19 Health and nutrition messaging and communication channels/ medium

In order to improve upon current health and nutrition messaging and communication, it is necessary to know the preferences of the target population (i.e., carers of children, primarily mothers) on channels and also on the timing of communications and messages. The following section describes survey results on carers' preferences on health and nutrition messaging and communications.

Preferred health communication channels average results

Across Sudan, the largest proportion of carers reported that they preferred outreach workers as their source of health and nutrition messages and communications at 34.7 per cent (95 per cent CI: 24.5-44.8) of the total. This was followed by radio, which was preferred by 21.2 per cent (95 per cent CI: 13-29.4) of carers, and then television, which was preferred by 19.7 per cent (95 per cent CI: 11.4-28.1) *(see Figure 333)*. These three channels together were the preferred source of health and nutrition messages and communications by 75.6 per cent of carers. Among the states, the largest number of carers preferred outreach workers as their source of health and nutrition messages and communications in 10 states. The highest preference in the remaining states was for television or radio *(see Figure 334)*.

FIGURE 333: Preferred medium - national

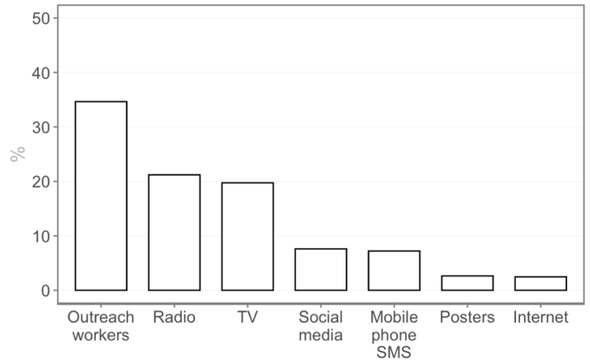


FIGURE 334: Preferred medium by state

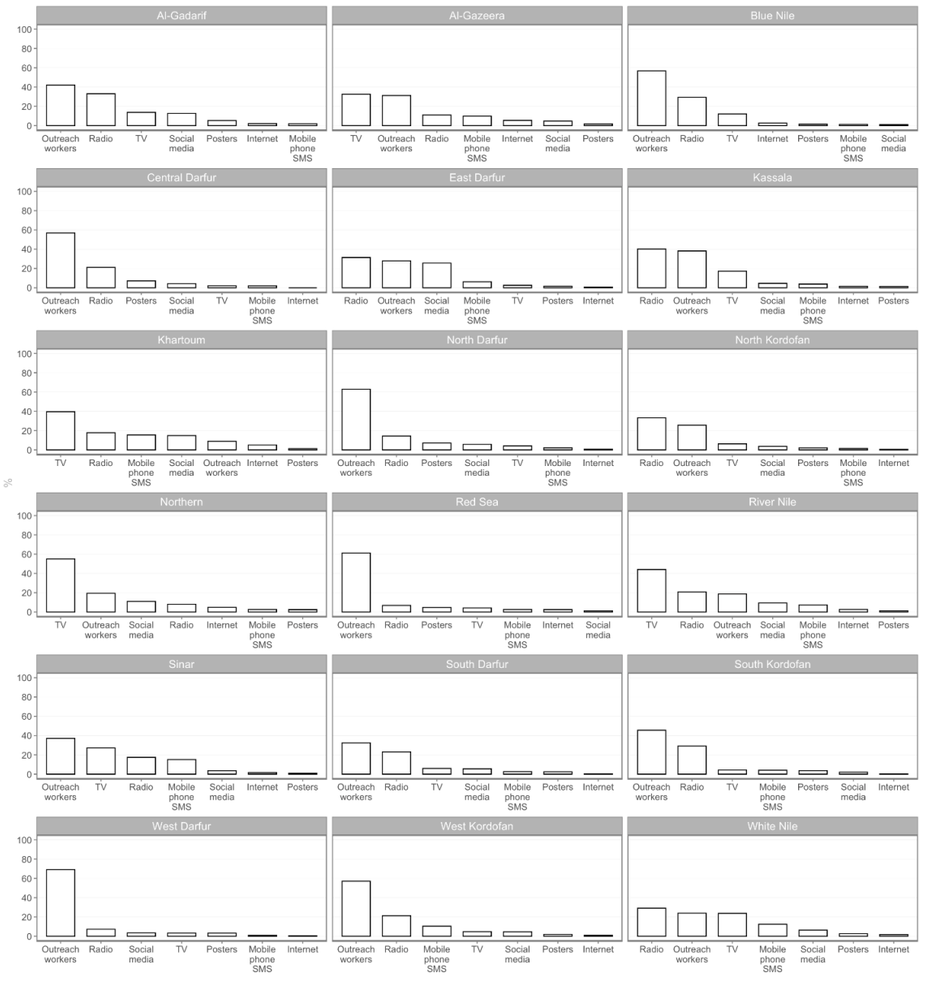


TABLE 100: Carers' preferred medium for health and nutrition messages and communications by state

State	Social media %			Mobile phone SMS %			Internet %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	12.66	4.36	20.96	1.95	0.01	4.68	2.14	0.01	5.03
Al-Gazeera	4.73	1.27	8.2	9.87	3.14	16.6	5.44	1.35	9.53
Blue Nile	1.04	0.01	2.89	1.27	0.01	2.8	2.63	0.01	6.23
Central Darfur	4.26	1.57	6.94	1.93	0.01	4.89	0	0	0.05
East Darfur	25.66	17.35	33.97	6.17	1.58	10.76	0.66	0.01	1.83
Kassala	4.59	0.01	9.8	3.85	1.24	6.45	1.46	0.01	3.19
Khartoum	14.78	7.85	21.71	15.45	6.3	24.6	5.09	1.29	8.9
North Darfur	5.78	1.27	10.28	2.19	0.01	4.58	0.67	0.01	1.69
North Kordofan	3.68	0.13	7.23	1.43	0.01	3.2	0.58	0.01	1.61
Northern	10.96	5.49	16.43	2.56	0.13	4.99	4.85	1.39	8.31
Red Sea	1.23	0.01	3.71	2.55	0.01	6.82	2.46	0.01	5.93
River Nile	9.38	4.72	14.04	7.3	3.04	11.57	2.62	0.79	4.45
Sennar	3.6	0.52	6.68	15.12	8.6	21.64	1.53	0.09	2.97
South Darfur	5.46	0.01	11.59	2.51	0.01	6.81	0.35	0.01	1.43
South Kordofan	1.97	0.01	5.28	4.05	0.01	8.2	0.31	0.01	1.1
West Darfur	3.49	0.01	8.34	0.86	0.01	2.11	0.49	0.01	1.28
West Kordofan	4.63	0.01	9.94	10.49	2.17	18.81	0.89	0.01	2.34
White Nile	6.33	1.47	11.19	12.46	7.45	17.47	1.7	0.01	3.62
Sudan	7.6	2.28	12.92	7.21	1.56	12.86	2.46	0.01	5.13

Outreach workers %			Posters %			Radio %			TV %		
Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
42.04	29.45	54.63	5.34	0.18	10.5	33	20.48	45.53	13.76	6.24	21.29
31.28	19.42	43.14	1.71	0.01	3.67	11.02	4.76	17.27	32.61	21.53	43.69
56.75	48.4	65.11	1.5	0.01	3.57	29.34	19.23	39.45	12.13	5.21	19.04
56.85	48.76	64.95	7.1	1.79	12.42	21.19	14.88	27.5	2.06	0.01	5.28
27.85	19.15	36.55	1.53	0.01	4.66	31.34	22.09	40.6	2.46	0.01	5.33
38.15	28.65	47.65	1.34	0.01	3.2	40.24	29.77	50.72	17.17	10.03	24.32
8.95	2.27	15.63	1.28	0.01	3.5	17.73	10.68	24.79	39.6	28.12	51.08
62.95	53.7	72.19	7.09	3.91	10.28	14.36	7.83	20.89	4.04	0.97	7.12
25.68	14.98	36.38	2.1	0.45	3.74	33.32	24.05	42.59	6.24	2.22	10.26
19.43	7.29	31.57	2.4	0.01	4.94	8.09	3.17	13	55.01	41.77	68.24
61.14	50.08	72.21	4.72	0.1	9.34	6.82	1.02	12.63	4.21	0.01	9.01
18.73	11.15	26.3	1.31	0.01	2.64	20.77	13.52	28.03	44.12	33.2	55.04
37.11	27.71	46.5	0.86	0.01	2.11	17.44	9.34	25.53	27.24	18.39	36.09
32.47	20.36	44.58	2.39	0.01	7.04	23.05	14.29	31.82	5.93	0.01	14.09
45.57	30.57	60.56	3.66	0.01	9.32	29.13	19.65	38.61	4.3	0.03	8.57
69.14	59.03	79.26	3.24	0.34	6.13	7.38	1.96	12.8	3.26	0.41	6.11
57.14	45.76	68.53	2.01	0.01	4.2	21.33	13.07	29.59	4.73	0.86	8.61
23.99	15.31	32.67	2.66	0.41	4.92	29.09	19.33	38.85	23.69	15.64	31.73
34.65	24.49	44.81	2.64	0.01	5.74	21.2	13	29.39	19.73	11.4	28.06

Preferred television channel

Across Sudan, Sudan TV was the most popular television channel *(see Figure 336)*, preferred by 7.9 per cent (95 per cent CI: 2.9-12.9) of all carers surveyed and about 43 per cent of those specific carers who preferred television as their source of health and nutrition messages. In 14 states, Sudan TV was the most popular television channel among carers *(see Figure 335)*.

FIGURE 335: Preferred TV channel by state

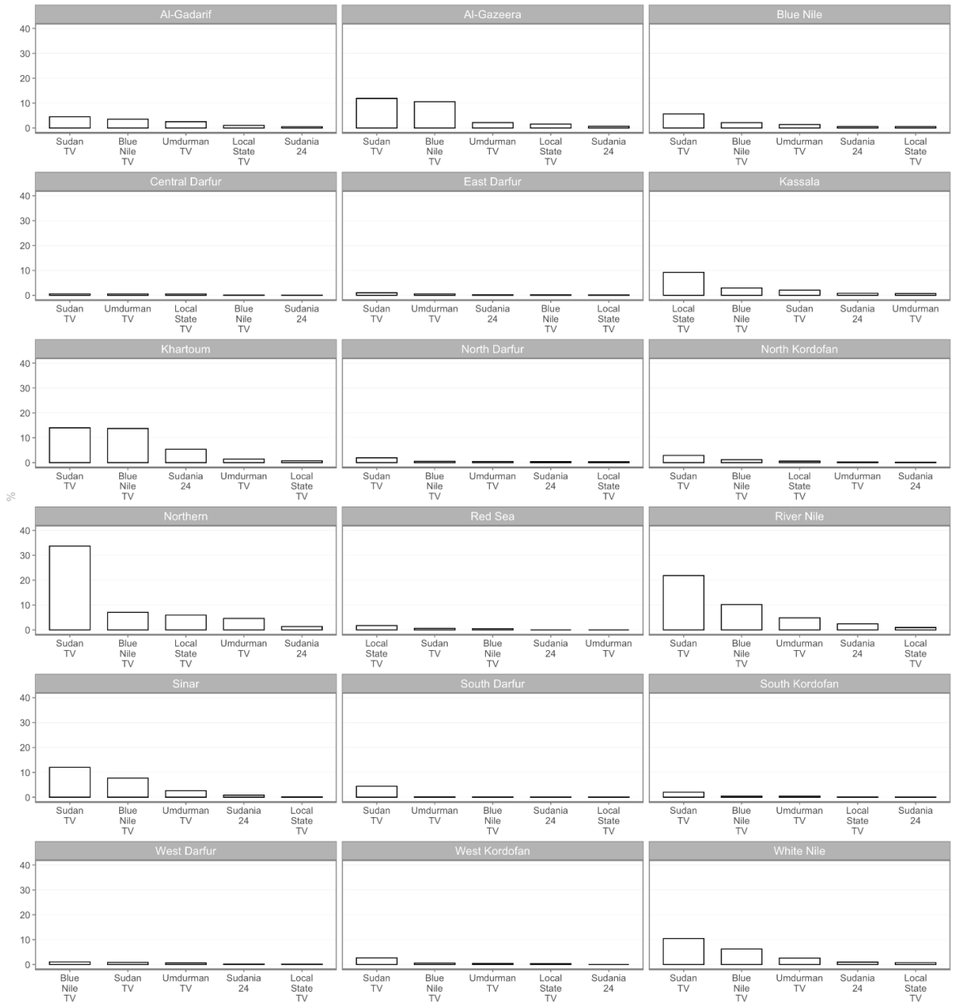


FIGURE 336: Preferred TV channel - national

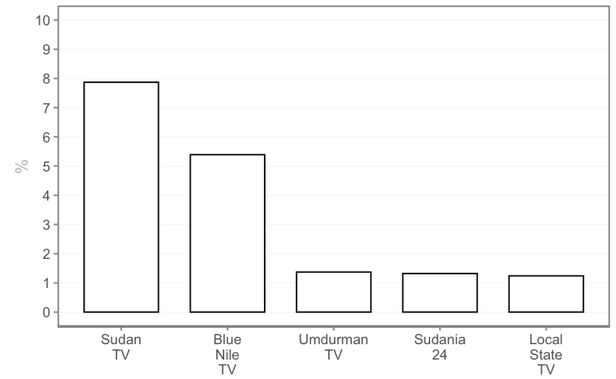


TABLE 101: Carers' preferred television channel for health and nutrition messages and communications by state

State	Sudan TV %			Local State TV %			Blue Nile TV %			Sudania 24 %			Umdurman TV %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	4.53	0.09	8.96	1.03	0.01	2.27	3.50	0.01	7.06	0.51	0.01	1.55	2.52	0.01	5.20
Al-Gazeera	11.90	6.35	17.45	1.55	0.01	3.28	10.56	5.77	15.34	0.67	0.01	1.69	2.16	0.27	4.05
Blue Nile	5.65	0.78	10.53	0.56	0.01	1.40	2.14	0.01	4.34	0.58	0.01	1.63	1.37	0.01	3.28
Central Darfur	0.56	0.01	1.91	0.52	0.01	1.62	0.10	0.01	0.44	0.06	0.01	0.28	0.54	0.01	1.69
East Darfur	0.99	0.01	2.83	0.14	0.01	0.58	0.20	0.01	0.93	0.21	0.01	0.75	0.55	0.01	1.36
Kassala	2.06	0.01	4.25	9.21	3.86	14.56	2.97	0.55	5.38	0.81	0.01	1.99	0.67	0.01	1.68
Khartoum	14.00	7.32	20.69	0.70	0.01	1.73	13.71	7.95	19.47	5.34	1.31	9.37	1.42	0.01	3.07
North Darfur	1.91	0.01	3.85	0.31	0.01	0.89	0.52	0.01	1.37	0.37	0.01	1.02	0.43	0.01	1.11
North Kordofan	2.87	0.10	5.64	0.60	0.01	1.49	1.18	0.01	2.70	0.18	0.01	0.72	0.25	0.01	0.83
Northern	33.71	23.08	44.33	5.93	2.31	9.55	7.04	3.16	10.93	1.32	0.01	3.02	4.61	0.01	9.28
Red Sea	0.61	0.01	1.90	1.75	0.01	4.76	0.51	0.01	1.48	0.00	0.00	0.14	0.00	0.00	0.05
River Nile	21.87	14.12	29.62	0.95	0.01	2.13	10.17	5.52	14.82	2.43	0.48	4.38	4.87	1.81	7.92
Sennar	11.98	6.52	17.44	0.17	0.01	0.73	7.66	3.92	11.40	0.85	0.01	1.86	2.62	0.63	4.62
South Darfur	4.40	0.01	10.62	0.03	0.01	0.31	0.11	0.01	0.50	0.05	0.01	0.33	0.17	0.01	1.40
South Kordofan	2.05	0.01	4.77	0.11	0.01	0.69	0.46	0.01	1.44	0.02	0.01	0.17	0.46	0.01	1.51
West Darfur	0.85	0.01	1.92	0.13	0.01	0.67	1.05	0.01	2.81	0.18	0.01	0.60	0.62	0.01	1.43
West Kordofan	2.69	0.01	5.39	0.33	0.01	1.11	0.57	0.01	1.64	0.00	0.00	0.04	0.42	0.01	1.27
White Nile	10.43	5.93	14.93	0.78	0.01	1.87	6.21	1.58	10.85	0.96	0.01	2.23	2.60	0.61	4.59
Sudan	7.87	2.87	12.88	1.24	0.01	2.99	5.39	1.81	8.96	1.32	0.01	3.16	1.37	0.01	3.09

Preferred radio station

Across Sudan, the national radio station was the most popular radio station *(see Figure 338),* preferred by 8.7 per cent (95 per cent CI: 3.6-13.9) of all carers, though the local state radio station was a close second, preferred by 6.6 per cent (95 per cent CI: 1.9-11.3) of caregivers. Carers who prefer either the national or local station accounted for about 75 per cent of those specific carers who said that they preferred radio as their source of health and nutrition messages. In 11 states, the national radio station was the most popular radio station among carers *(see Figure 337).*

FIGURE 337: Preferred radio station by state

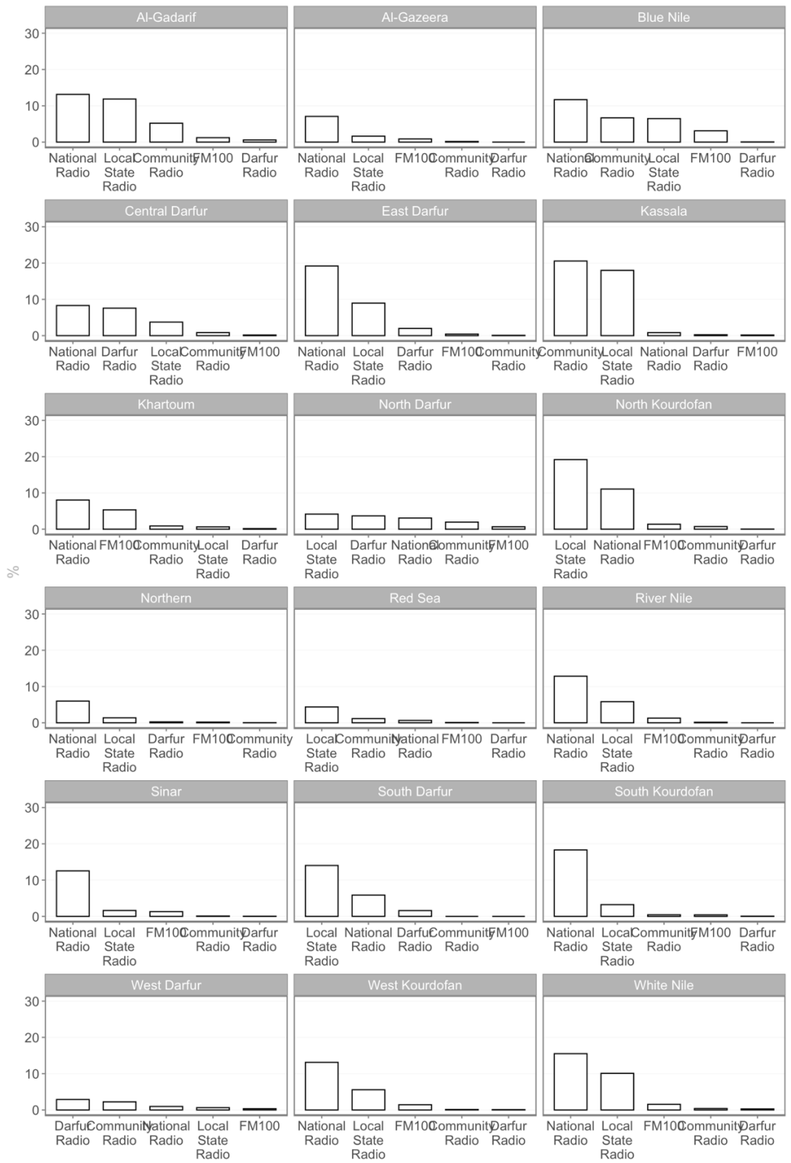


FIGURE 338: Preferred radio station - national

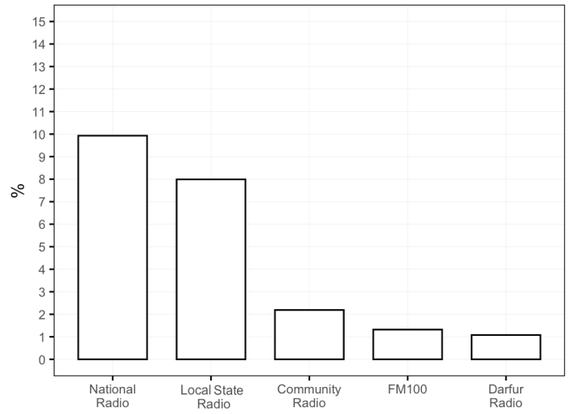


TABLE 102: Carers' preferred radio station for health and nutrition messages and communications by state

State	Sudan Radio %			Local State Radio %			FM100 %			Community Radio %			Darfur Radio %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	13.14	5.63	20.65	11.86	4.12	19.61	1.21	0.01	3.03	5.2	0.79	9.6	0.58	0.01	1.58
Al-Gazeera	7.07	2.74	11.41	1.63	0.01	3.72	0.86	0.01	2.23	0.17	0.01	0.79	0	0	0
Blue Nile	11.69	5.38	18.01	6.47	1.86	11.09	3.1	0.01	6.31	6.67	1.28	12.05	0.05	0.01	0.4
Central Darfur	8.3	2.17	14.43	3.74	0.66	6.81	0.17	0.01	0.55	0.84	0.01	2.23	7.58	1.53	13.62
East Darfur	19.2	12.09	26.31	8.97	3.27	14.67	0.43	0.01	1.22	0.09	0.01	0.57	1.99	0.01	4.13
Kassala	0.83	0.01	1.92	17.98	10.28	25.68	0.17	0.01	0.72	20.57	12.1	29.04	0.25	0.01	0.84
Khartoum	8.05	2.94	13.15	0.66	0.01	1.77	5.34	2.17	8.51	0.9	0.01	2.41	0.17	0.01	0.74
North Darfur	3.09	0.47	5.7	4.17	0.92	7.41	0.69	0.01	1.77	1.96	0.01	4.28	3.68	1.02	6.35
North Kordofan	11.07	4.73	17.41	19.19	13.01	25.36	1.37	0.12	2.61	0.75	0.01	1.76	0.02	0.01	0.21
Northern	5.98	1.4	10.55	1.37	0.01	3.1	0.19	0.01	0.75	0.03	0.01	0.39	0.26	0.01	1.03
Red Sea	0.66	0.01	1.96	4.38	0.25	8.51	0.08	0.01	0.48	1.16	0.01	3.78	0	0	0.1
River Nile	12.85	6.78	18.92	5.83	2.35	9.31	1.28	0.01	2.66	0.15	0.01	0.7	0	0	0
Sennar	12.54	6.44	18.64	1.61	0.01	3.83	1.31	0.01	3.06	0.1	0.01	0.54	0.04	0.01	0.44
South Darfur	5.87	1.06	10.67	14.03	7.37	20.69	0	0	0.44	0	0	0	1.59	0.01	4.58
South Kordofan	18.31	10.99	25.62	3.24	0.51	5.98	0.42	0.01	1.38	0.44	0.01	1.23	0.06	0.01	0.47
West Darfur	0.96	0.01	2	0.63	0.01	1.54	0.34	0.01	1.07	2.24	0.01	5.6	2.88	0.01	6.11
West Kordofan	13.12	7.38	18.87	5.57	1.13	10.02	1.44	0.01	3.29	0.13	0.01	0.53	0.09	0.01	0.35
White Nile	15.52	9.99	21.05	10.08	2.17	17.99	1.54	0.01	3.12	0.39	0.01	1.28	0.29	0.01	1.11
Sudan	8.72	3.56	13.88	6.58	1.89	11.27	1.59	0.01	3.37	2.05	0.01	4.71	0.83	0.01	2.49

Preferred programs

Across Sudan, carers preferred the news to all other program types used for health and nutrition communications and messaging *(see Figure 340)*. The news was the preferred program type for 18.7 per cent (95 per cent CI: 11.0-26.3) of all carers, followed by talk shows at 13.1 per cent (95 per cent CI: 7.3-18.8), then serials at 9.1% (95 per cent CI: 3.6-14.6). Carers who preferred news, talk shows or serials as the program type for health and nutrition communications and messaging accounted for 42 per cent of carers surveyed. In 14 states, the news ranked as the top preferred program type for health and nutrition messaging among carers *(see Figure 339)*.

FIGURE 339: Preferred program by state

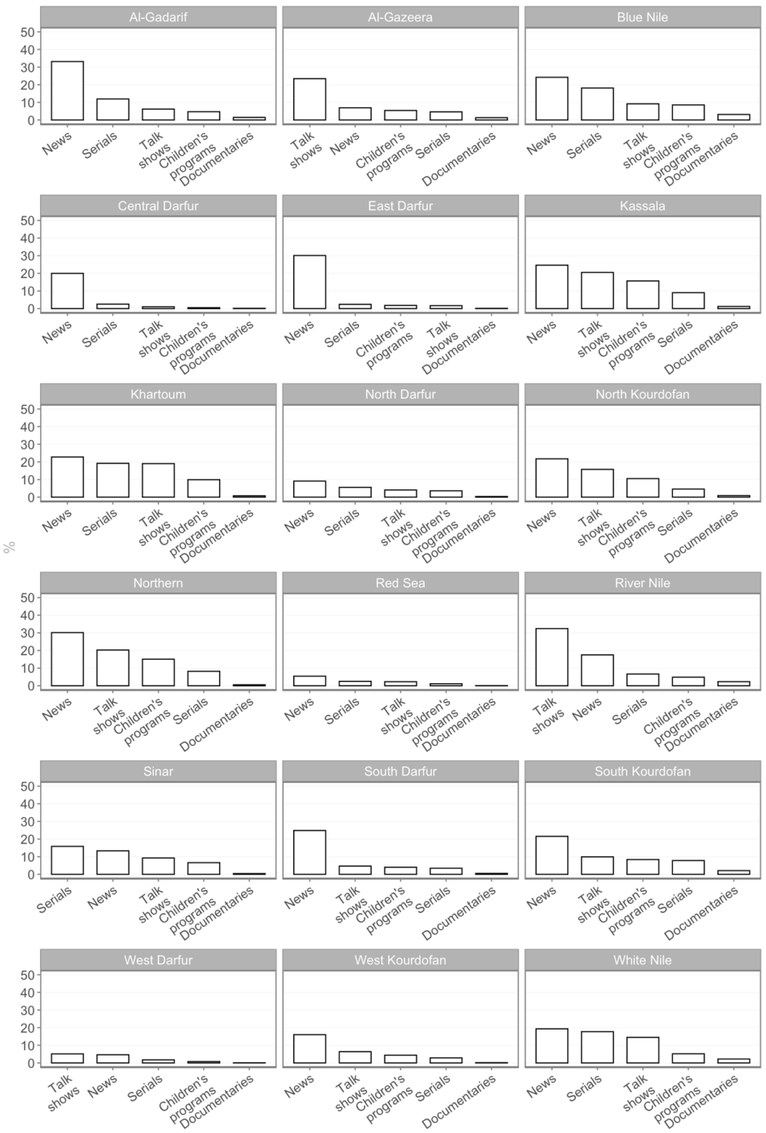


FIGURE 340: Preferred program - national

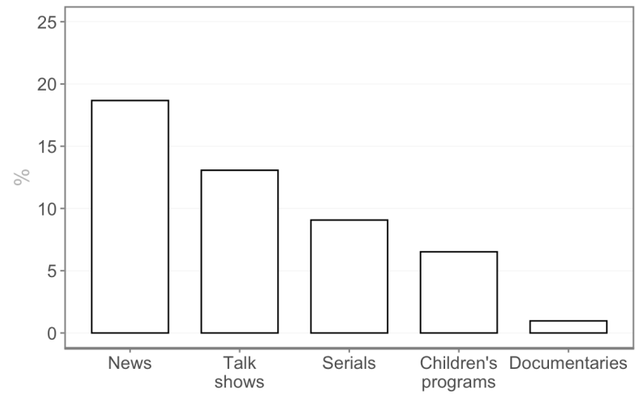


TABLE 103: Carers' preferred program type for health and nutrition messages and communications by state

State	News %			Serials %			Talk shows %			Children's programs %			Documentaries %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	33.16	20.48	45.85	11.93	6.06	17.79	6.19	1.9	10.48	4.7	0.82	8.58	1.46	0.01	3.97
Al-Gazeera	6.94	2.65	11.24	4.61	1.1	8.12	23.45	16.11	30.79	5.41	2.38	8.44	1.32	0.01	3.34
Blue Nile	24.23	15.94	32.51	18.15	10.79	25.51	9.17	4.81	13.54	8.56	3.98	13.13	3.13	0.65	5.61
Central Darfur	19.98	13.19	26.78	2.53	0.01	6.65	1.05	0.01	2.66	0.52	0.01	1.51	0.17	0.01	0.62
East Darfur	30.1	20.88	39.32	2.43	0.01	4.98	1.67	0.01	3.86	1.8	0.01	4.11	0.15	0.01	0.72
Kassala	24.63	16.42	32.85	9.01	2.48	15.54	20.51	12.97	28.06	15.67	9.47	21.88	1.22	0.01	3.26
Khartoum	22.8	14.77	30.83	19.18	11.45	26.9	19.05	12.36	25.75	9.92	4.61	15.22	0.78	0.01	2.02
North Darfur	9.11	4.51	13.71	5.58	1.22	9.94	4.09	1.63	6.55	3.63	1.28	5.98	0.38	0.01	1.02
North Kordofan	21.77	13.88	29.66	4.58	1.49	7.67	15.78	8.95	22.6	10.52	5.47	15.56	0.91	0.01	2.29
Northern	30.13	19.3	40.96	8.19	2.81	13.57	20.25	13.02	27.47	15.05	7.17	22.93	0.56	0.01	1.62
Red Sea	5.44	0.89	9.99	2.52	0.01	6.06	2.31	0.01	5.59	1.15	0.01	3.15	0.07	0.01	0.45
River Nile	17.51	9.89	25.14	6.65	2.59	10.71	32.41	24.55	40.28	4.85	1.94	7.75	2.34	0.01	4.82
Sennar	13.33	7.01	19.66	15.86	7.68	24.05	9.26	4.95	13.56	6.6	2.71	10.49	0.45	0.01	1.46
South Darfur	24.88	15.28	34.48	3.45	0.12	6.78	4.66	1.13	8.18	4.03	0.5	7.56	0.54	0.01	3.25
South Kordofan	21.53	12.8	30.27	7.81	2.82	12.8	9.9	4.02	15.78	8.4	3.24	13.56	2.1	0.01	5.11
West Darfur	4.62	0.59	8.64	1.72	0.03	3.4	5.12	0.43	9.8	0.76	0.01	1.82	0.06	0.01	0.37
West Kordofan	16.04	8.41	23.67	2.86	0.01	5.88	6.37	2.06	10.69	4.39	1.13	7.65	0.14	0.01	0.65
White Nile	19.33	13.33	25.34	17.74	9.09	26.39	14.51	7.37	21.64	5.18	2.36	7.99	2.21	0.01	4.44
Sudan	18.67	11.01	26.33	9.07	3.55	14.58	13.07	7.32	18.82	6.52	2.45	10.6	0.97	0.01	2.74

Preferred time to receive health messages

Across Sudan, 17.3 per cent (95 per cent CI: 10.2-24.3) of carers preferred the evening as the best time to receive health and nutrition messages, followed closely by morning time at 16.9 per cent (95 per cent CI: 9.9-23.8) *(see Figure 342)*. These were the two most popular times, and together they accounted for the preferences of 36 per cent of carers surveyed. Across Sudan, carers preferred to receive health and nutrition messaging in the morining or evening *(see Figure 341)*.

FIGURE 341: Preferred time to receive health messages by state

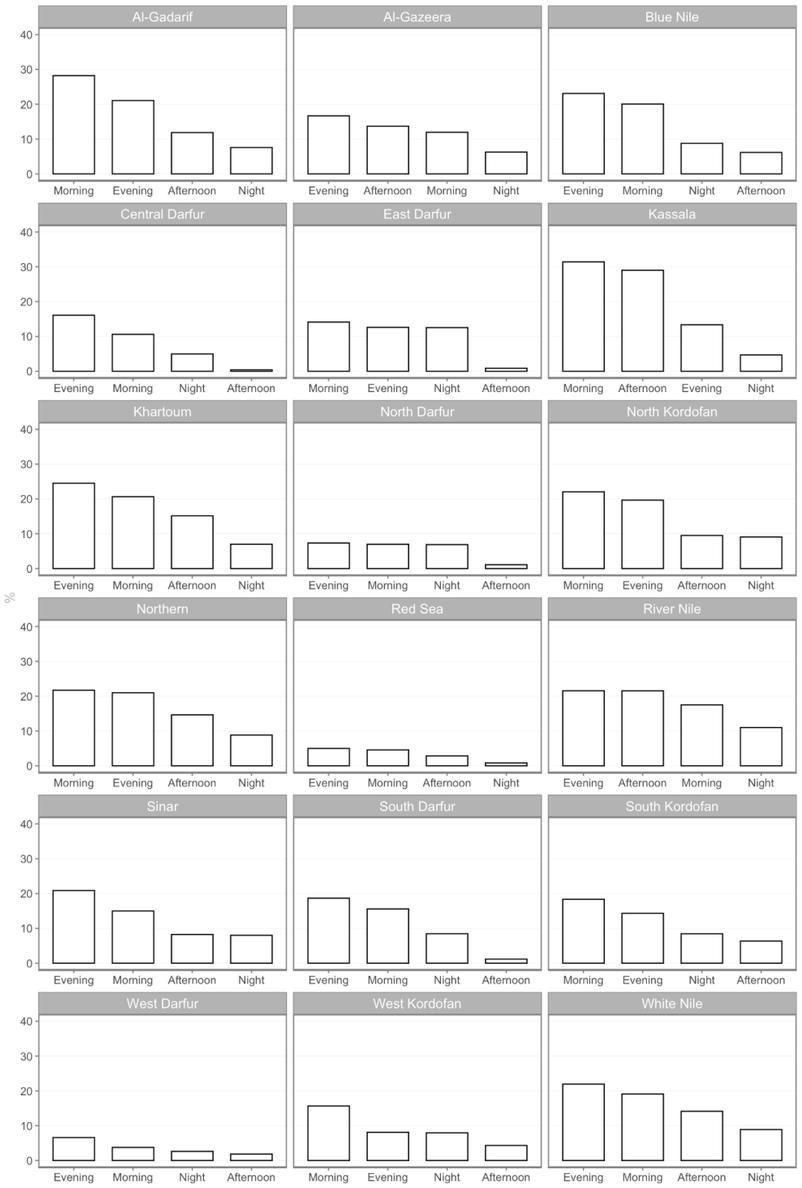


FIGURE 342: Preferred time to receive health messages – national

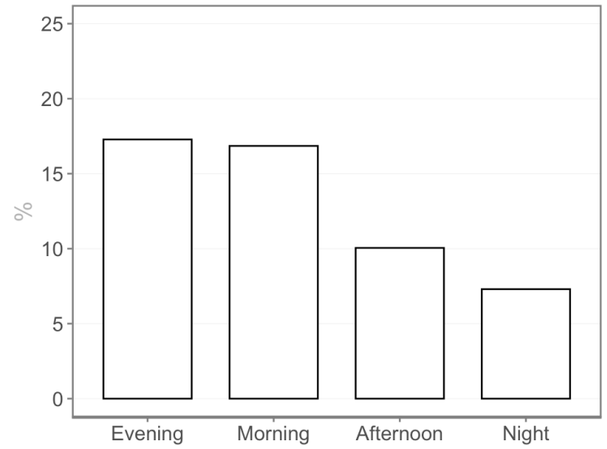


TABLE 104: Carers' preferred time to receive health and nutrition messages and communications by state

State	Morning %			Afternoon %			Evening %			Night %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	28.24	16.62	39.86	11.87	5.37	18.37	21.07	13.06	29.09	7.57	2.55	12.59
Al-Gazeera	11.94	6.59	17.3	13.7	7.79	19.61	16.67	9.98	23.36	6.27	2.13	10.41
Blue Nile	20.05	12.33	27.76	6.15	1.96	10.34	23.1	15.42	30.77	8.78	4.14	13.43
Central Darfur	10.59	2.99	18.18	0.4	0.01	1.11	16.1	11.04	21.15	4.97	0.01	9.96
East Darfur	14.13	7.41	20.86	0.85	0.01	2.02	12.61	6.38	18.84	12.52	6.13	18.91
Kassala	31.41	23.03	39.78	28.98	20.35	37.61	13.35	8.14	18.55	4.67	1.51	7.83
Khartoum	20.62	13.63	27.61	15.14	7.82	22.47	24.51	16.3	32.73	7.01	2.66	11.36
North Darfur	6.99	3.24	10.75	1.09	0.01	2.3	7.35	2.69	12.01	6.87	3.03	10.72
North Kordofan	22.05	15.28	28.83	9.49	5.48	13.5	19.66	13.13	26.2	9.05	4.27	13.83
Northern	21.74	13.38	30.1	14.63	7.75	21.51	21.02	13.28	28.77	8.83	4.04	13.62
Red Sea	4.57	0.01	9.17	2.87	0.01	6.93	4.99	0.01	10.1	0.82	0.01	2.34
River Nile	17.53	12.04	23.02	21.55	14.11	28.99	21.57	14.1	29.03	11.02	6.07	15.97
Sennar	14.99	9.17	20.82	8.23	4.34	12.11	20.87	14	27.75	8.01	3.06	12.97
South Darfur	15.56	8.06	23.06	1.16	0.01	3.6	18.66	9.37	27.95	8.46	3.37	13.56
South Kordofan	18.35	10.43	26.26	6.34	2.54	10.14	14.3	8.04	20.56	8.45	3.42	13.47
West Darfur	3.75	0.83	6.67	1.85	0.01	4.16	6.59	1.66	11.52	2.61	0.01	5.47
West Kordofan	15.65	8.88	22.43	4.31	1.28	7.34	8.11	3.73	12.5	7.93	3.67	12.2
White Nile	19.09	11.8	26.37	14.11	8.77	19.44	21.95	13.68	30.23	8.9	4.51	13.29
Sudan	16.85	9.94	23.75	10.05	4.73	15.38	17.28	10.23	24.34	7.3	2.85	11.75

3.20 Water, sanitation and hygiene (WASH)

3.20.1 Drinking water access

Drinking water access average results

The proportion of households with access to improved sources of drinking water in the S3M II survey was 83.03 per cent (95 per cent CI: 82.84-83.22). However, for access to improved sources of drinking water within 30 minutes of the home, this dropped to 73.73 per cent (95 per cent CI: 73.51-73.95).

Northern state had the highest proportion of households with access to improved sources of drinking water overall and within 30 minutes of the home, while Al-Gadarif state had the lowest for both indicators.

Across the localities, there was low variability in intra-state and inter-locality estimates for access to improved water sources overall. This variability was much higher for access to drinking water within 30 minutes of the home. About 30.8 per cent of localities had less than 50 per cent access to improved sources of drinking water within 30 minutes of the home.

Table 105 and Table 106 present results by locality, by state and at the national level for access to improved sources of drinking water, overall and within 30 minutes of the home.

TABLE 105: Improved drinking water sources by state and national

State	Uses Improved Drinking Water Sources			Uses Basic Drinking Water Sources (Within 30 Minutes) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	97.33	96.67	97.84	97.32	96.63	97.87
Al-Gazeera	95.67	94.38	96.41	94.02	91.99	95.49
Blue Nile	96.13	95.01	97.11	91.89	89.35	93.82
Central Darfur	89.93	86.54	92.50	87.63	83.70	90.66
East Darfur	81.41	75.52	86.56	80.00	73.66	85.49
Kassala	61.00	55.75	65.58	53.80	47.65	59.82
Khartoum	66.42	61.26	70.41	58.02	52.52	63.73
North Darfur	78.32	73.62	82.22	54.12	49.37	58.87
North Kordofan	78.57	75.70	80.76	67.52	63.56	70.96
Northern	56.34	51.93	60.55	52.65	48.44	56.89
Red Sea	81.58	78.99	83.88	63.64	58.89	68.61
River Nile	87.68	85.66	89.31	78.52	75.52	81.43
Sennar	85.57	83.90	86.84	67.79	63.67	71.62
South Darfur	78.23	75.42	80.78	61.73	58.00	65.34
South Kordofan	83.35	81.45	84.75	72.79	69.71	75.98
West Darfur	69.23	66.18	71.77	59.15	54.94	63.66
West Kordofan	87.72	85.47	89.12	61.00	56.24	65.48
White Nile	86.35	85.63	86.93	60.96	56.03	65.34
Sudan	83.03	82.84	83.22	73.73	73.51	73.95

TABLE 106: Improved drinking water sources by locality and state

Location	Uses Improved Drinking Water Sources			Uses Basic Drinking Water Sources (Within 30 Minutes) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	98.97	97.75	100.00	99.01	97.79	100.00
El Golid	88.90	88.07	89.73	88.49	87.66	89.32
Merwoe	92.81	86.65	96.30	94.15	87.99	97.64
El Daba	97.06	96.52	97.60	97.38	96.84	97.92
Halfa	98.35	96.76	99.39	98.32	96.73	99.36
Delgo	100.00	99.20	100.00	100.00	99.20	100.00
El Burgaig	99.43	98.37	100.00	99.36	97.49	100.00
Northern State	97.33	96.67	97.84	97.32	96.63	97.87
El Matama	99.41	98.33	100.00	98.40	96.57	99.37
Shendi	84.70	75.12	90.56	74.33	63.17	82.33
Abu Hamad	95.14	88.12	100.00	94.62	84.41	100.00
Barbar	93.32	92.54	94.10	90.60	83.21	97.99
El Damar	96.59	95.28	97.30	96.00	91.23	97.20
Atbara	97.97	95.76	100.00	97.87	94.98	100.00
El Buhaira	71.95	69.84	73.60	67.64	61.61	71.21
River Nile State	95.67	94.38	96.41	94.02	91.99	95.49
Khartoum	94.88	92.35	96.90	95.19	92.71	97.28
Bahri	97.63	95.98	98.94	97.57	95.71	99.02
Um Durman	96.06	92.97	97.82	92.05	85.63	96.46
Um Bada	93.04	90.12	95.35	81.95	71.80	91.12
Jebel Awlia	96.01	93.02	98.13	94.69	91.82	96.74
Sharg Elneel	92.49	88.24	95.70	89.34	85.03	93.10
Karrari	96.44	94.06	98.28	94.57	87.43	96.94
Khartoum State	96.13	95.01	97.11	91.89	89.35	93.82
Greater Medani	95.16	90.66	97.41	95.16	90.05	97.34
Ganub Elgazira	97.64	95.70	98.50	96.87	93.53	98.59
El Hassahisa	97.16	95.15	98.61	96.30	94.25	98.00
El Kamlin	92.35	78.66	98.78	92.26	78.61	98.82
Sharg El Gezira	88.91	80.87	93.00	76.01	57.32	88.12
Um Elqura	84.03	70.11	90.88	82.54	68.69	89.51
El Manaqil	73.61	54.85	88.38	72.10	52.46	88.21
El Qurashi	78.51	71.75	81.23	78.49	71.03	82.19
Al-Gazeera State	89.93	86.54	92.50	87.63	83.70	90.66
Sennar	96.40	94.48	98.32	96.21	93.68	98.74
Sharg Sennar	98.80	97.50	100.00	98.43	97.13	99.73

TABLE 106: Improved drinking water sources by locality and state

Location	Uses Improved Drinking Water Sources			Uses Basic Drinking Water Sources (Within 30 Minutes) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sinja	96.14	89.90	97.34	95.23	89.21	96.68
Abu Hujar	64.29	49.43	75.08	53.60	35.93	69.28
El Dali	32.21	13.81	53.24	26.95	9.00	47.86
Es Suki	87.22	71.34	95.65	87.50	71.62	95.93
Ed Dinder	95.75	89.04	100.00	90.22	83.03	93.48
Sennar State	81.41	75.52	86.56	80.00	73.66	85.49
Ed Damazine	81.34	80.09	82.59	76.45	67.56	82.28
El Tadamon	16.52	15.52	17.52	15.04	5.49	24.59
El Roseiris	48.67	34.73	60.98	44.07	30.16	55.47
Baw	47.94	27.42	68.46	42.28	24.86	59.58
Geisan	51.68	32.11	71.23	36.12	11.95	60.01
El Kurmuk	72.77	66.15	79.39	66.26	52.89	79.63
Wad El Mahi	84.11	78.95	89.27	70.47	57.86	79.34
Blue Nile State	61.00	55.75	65.58	53.80	47.65	59.82
Kosti	61.82	61.82	61.82	55.74	48.61	61.91
Guli	62.68	55.37	69.99	46.87	35.88	57.02
Tendalti	87.62	85.36	89.88	75.06	62.86	84.57
Es Salam	80.29	68.40	92.18	46.09	24.60	67.22
Rabak	79.88	66.22	88.92	72.79	57.47	85.36
El Jabalain	43.21	19.49	64.89	42.82	19.38	64.98
El Diwaim	48.71	48.31	49.11	43.46	32.13	50.62
Um Rimta	59.46	44.57	76.24	36.42	19.46	56.14
El Gitaina	81.34	69.28	87.75	74.32	59.14	87.51
White Nile State	66.42	61.26	70.41	58.02	52.52	63.73
Port Sudan	57.90	45.60	68.53	54.91	42.95	67.21
Swakin	97.85	96.47	99.23	33.90	18.87	48.65
El Gonob Welawlaib	93.55	92.14	94.96	47.63	35.91	60.55
Sinkat	76.83	64.85	88.73	46.38	32.47	63.01
Haya	93.20	91.28	95.12	53.40	37.56	68.86
Dordieb	91.66	81.29	100.00	47.89	33.32	60.67
Tokar	81.64	71.14	88.63	56.08	43.15	67.68
Agig	94.24	94.24	94.24	81.72	71.47	90.22
Gabaot Elma-aadin	64.92	48.15	79.99	44.50	30.68	60.79
Halaeeb (accessible parts)	93.68	79.38	100.00	82.01	62.14	100.00

TABLE 106: Improved drinking water sources by locality and state

Location	Uses Improved Drinking Water Sources			Uses Basic Drinking Water Sources (Within 30 Minutes) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Red Sea State	78.32	73.62	82.22	54.12	49.37	58.87
Kassala Town	97.90	97.90	97.90	96.79	94.17	99.41
Refi Kassla	89.22	83.15	95.29	68.11	57.27	76.59
Rural Western Kassala	95.17	85.56	100.00	73.18	57.68	87.03
New Halfa	85.01	80.96	88.25	83.80	75.80	89.94
Refi Nahr Atbara	48.61	41.21	54.09	47.65	39.22	53.92
Rural Khashm Elgirba	80.12	59.03	92.31	78.78	55.49	91.81
Rural Wad Elhilaiw	41.16	31.51	48.34	38.09	27.55	48.43
Rural Aroma	49.47	28.28	71.19	32.15	14.51	51.10
Refi North Delta	93.02	87.02	96.98	42.82	25.12	58.64
Refi Hamashkureib	90.36	84.75	95.13	76.58	65.05	87.49
Rural Telkok	92.13	88.63	95.63	70.54	58.13	82.74
Kassala State	78.57	75.70	80.76	67.52	63.56	70.96
Gedaref Town	92.20	87.82	95.34	68.56	54.78	81.07
Middle Geddaref	58.96	37.77	79.15	58.62	38.03	77.60
Elbutana	23.08	10.07	39.15	11.76	0.86	25.53
El Fashaga	71.31	58.43	84.12	67.70	50.78	82.54
El Rahad	20.36	9.93	28.20	21.24	11.52	28.89
Gala-a El Nahal	41.98	22.30	58.18	42.26	25.31	57.39
El Fao	38.69	26.14	51.25	37.91	26.28	49.39
El Qureisha	50.00	27.97	65.96	51.34	29.93	67.58
El Mafaza	36.54	15.32	56.57	33.16	15.02	50.96
Basunda	63.12	58.15	68.09	61.54	53.51	66.71
Western Galabat	65.19	51.12	75.66	62.74	47.84	74.04
Eastern Galabat	67.45	55.96	76.58	62.41	51.09	73.91
Al-Gadarif State	56.34	51.93	60.55	52.65	48.44	56.89
Sheikan	81.98	72.70	89.17	78.10	68.79	84.85
Um Rawaba	87.51	80.24	91.90	59.42	45.02	73.90
Um Dam Haj Ahmed	97.69	96.56	98.82	87.46	76.84	94.16
El Rahad	46.38	40.25	52.51	33.66	19.74	45.03
Bara	97.01	86.99	98.08	72.35	53.01	88.51
Gharb Bara	69.26	59.82	74.45	31.22	12.00	48.99
Soudari	68.87	65.19	71.54	48.48	42.34	55.94
Gebrat El Sheikh	85.60	84.12	87.08	68.97	55.96	79.10
North Kordofan State	81.58	78.99	83.88	63.64	58.89	68.61

TABLE 106: Improved drinking water sources by locality and state

Location	Uses Improved Drinking Water Sources			Uses Basic Drinking Water Sources (Within 30 Minutes) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kadugli	98.27	97.90	98.64	87.36	82.04	92.57
Reif Shargi	87.77	76.39	93.55	81.42	65.30	91.17
Dilling	96.65	89.28	100.00	96.96	81.93	100.00
El Quoz	86.54	74.94	93.70	80.49	65.91	90.59
Habila	81.11	70.16	92.06	66.04	48.11	78.54
Abassiya	82.01	73.00	87.48	75.76	66.34	83.77
El Rashad	95.70	92.20	97.23	88.09	81.12	93.29
Abu Jubaiha	60.83	56.46	65.20	49.35	39.46	57.28
El Tadamon	71.96	62.49	81.43	63.87	52.54	71.80
Talodi	75.14	62.61	83.54	55.71	40.65	73.60
Ghadeer	63.16	47.91	75.15	47.20	20.28	69.68
El Leri	93.94	92.03	95.85	77.96	71.48	84.79
Abu Karshola	93.70	83.46	100.00	87.89	76.61	96.03
Delami	97.65	96.52	98.78	91.21	80.04	96.73
South Kordofan State	87.68	85.66	89.31	78.52	75.52	81.43
Abu Zabad	92.74	90.40	95.08	82.59	70.93	91.20
ElKhiwai	82.65	82.65	82.65	45.53	19.88	65.10
Ghubaish	99.66	99.66	99.66	78.33	59.70	92.37
El Nuhud	70.85	70.15	71.55	17.89	0.43	35.90
El Idia	89.19	89.19	89.19	70.63	54.57	82.95
Wad Benda	83.15	76.16	90.14	54.72	37.61	69.02
Lagawa	80.42	80.42	80.42	45.59	31.05	60.51
Elsunut	46.81	44.41	49.21	35.88	24.10	45.03
Keilik	88.49	81.03	95.95	85.48	75.53	90.12
Es Salam	86.50	76.14	93.50	73.09	61.87	82.31
Babanusa	100.00	99.34	100.00	86.47	69.87	97.18
Abyei	75.85	75.85	75.85	75.47	63.77	81.06
El Dibab	74.37	56.84	91.90	66.86	39.49	84.41
El Meiram	90.25	90.25	90.25	86.42	81.29	89.08
West Kordofan State	85.57	83.90	86.84	67.79	63.67	71.62
El Fasher	77.66	68.00	85.05	65.64	55.17	73.72
Tawila	80.38	74.60	85.02	47.09	36.39	57.39
Melit	91.34	88.22	93.31	25.84	10.14	43.60
Um Kadada	83.75	73.52	90.41	69.31	54.41	81.64
Kebkabiya	59.54	58.34	60.74	52.69	44.53	60.05

TABLE 106: Improved drinking water sources by locality and state

Location	Uses Improved Drinking Water Sources			Uses Basic Drinking Water Sources (Within 30 Minutes) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kutum	90.07	83.42	94.90	77.96	64.37	88.54
El Mahalha	99.10	99.10	99.10	74.04	55.04	87.66
Saraf Omra	28.40	8.46	47.09	23.19	5.22	41.87
El Serief	28.08	20.86	34.24	24.92	16.95	31.69
Dar Elsalam	70.92	67.57	73.38	54.93	37.02	71.42
Kelemando	71.30	69.42	72.99	46.69	30.55	62.81
El Tawisha	95.41	93.04	97.41	78.65	65.67	88.52
Um Baru	95.81	94.23	97.39	51.19	31.47	71.11
El Lait	88.85	84.76	92.53	81.38	70.16	88.40
ELkuma	91.98	81.34	95.99	78.72	42.41	90.47
El Tina	90.69	86.93	93.65	82.14	65.83	89.70
Kernoi	86.58	82.50	88.74	63.30	47.08	74.85
North Darfur State	78.23	75.42	80.78	61.73	58.00	65.34
Nyala South	97.60	97.60	97.60	94.02	87.15	97.06
Nyala North	92.98	88.72	97.24	68.69	40.57	86.97
Es Salam	75.02	66.22	78.94	61.79	49.54	72.37
El Wihda	98.78	98.78	98.78	93.33	86.47	96.78
Mershing	89.18	83.48	92.60	84.73	71.03	92.65
Beliel	92.75	85.89	95.98	78.74	70.00	85.98
Nitega	91.85	87.67	96.03	81.21	68.70	89.33
Sharg El Jabal (accessible parts)	89.29	89.29	89.29	64.29	-4.18	100.00
Kas	70.97	70.97	70.97	45.77	32.27	57.74
Shattaya	53.64	53.64	53.64	31.67	17.04	44.95
Buram	60.28	43.42	75.23	56.07	37.45	71.05
Gereida	88.40	79.16	94.42	83.53	71.66	92.52
El Sunta	17.37	17.37	17.37	12.19	-1.51	21.85
El Radoum	67.14	63.31	70.97	61.24	52.02	68.01
Tulus	71.18	47.12	89.85	67.41	45.87	83.47
Damso	74.35	61.44	86.60	57.61	37.29	77.20
Ed Elfursan	73.13	73.13	73.13	64.76	50.91	74.73
Kubum	60.85	57.57	64.13	59.93	53.03	64.47
Kateila	66.77	66.77	66.77	44.21	25.55	60.97
Rehaid Elbirdi	55.95	37.58	73.77	42.13	26.18	57.43
Um Dafoug	11.74	0.49	31.89	9.94	0.10	25.62

TABLE 106: Improved drinking water sources by locality and state

Location	Uses Improved Drinking Water Sources			Uses Basic Drinking Water Sources (Within 30 Minutes) %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Darfur State	83.35	81.45	84.75	72.79	69.71	75.98
Abu Jabra	78.82	73.85	82.93	65.42	52.25	75.81
Abu Karinka	96.85	91.57	100.00	85.27	74.28	91.30
Bahr El Arab	35.40	35.40	35.40	23.69	5.84	39.98
Adila	98.39	98.05	98.73	78.27	63.98	89.40
Ed Dain	93.71	89.99	96.11	89.76	82.82	93.42
Assalaya	51.65	50.61	52.69	24.83	15.15	34.69
El Firdous	15.28	-1.13	27.92	10.98	-4.68	25.72
Shia-ria	56.81	52.20	61.42	52.18	34.03	65.68
Yassin	25.64	12.44	39.27	18.86	6.65	33.55
East Darfur State	69.23	66.18	71.77	59.15	54.94	63.66
El Geneina	94.37	93.12	95.62	80.27	74.20	86.33
Habila	59.88	50.31	69.40	21.78	9.09	36.77
Kulbus	91.69	91.69	91.69	47.53	29.88	66.18
Beida	83.90	72.51	93.44	45.07	35.23	56.10
Foro Baranga	88.48	85.57	91.39	49.25	30.73	66.50
Kereneik	86.45	84.69	88.21	65.42	54.45	74.54
Sirba	89.59	83.58	94.48	39.45	23.51	57.82
Jebel Moon	83.78	79.68	86.18	40.09	26.59	52.17
West Darfur State	87.72	85.47	89.12	61.00	56.24	65.48
Zalingi	87.61	86.49	88.68	58.05	50.13	65.50
Wadi Salih	90.06	90.06	90.06	79.30	71.38	85.13
Mukjar	75.42	75.42	75.42	57.53	38.62	73.09
Central Jebel Mara	100.00	100.00	100.00	32.67	15.97	52.58
North Jebel Mara	62.23	60.11	64.35	0.96	0.45	3.39
Bendasi	96.64	95.19	98.09	81.74	64.38	93.14
Nertiti	85.76	84.69	86.83	59.73	52.60	66.34
Azum	83.71	80.94	85.47	82.30	77.32	85.53
Um Dukhun	85.78	82.83	87.87	68.76	55.90	78.83
Central Darfur State	86.35	85.63	86.93	60.96	56.03	65.34

Spatial distribution of drinking water access

High access to improved sources of drinking water overall was evenly spread throughout Sudan *(see Figure 343).* When the within-30-minutes criteria was considered, a notable belt of low coverage to improved sources of drinking water within 30 minutes was seen running from east to west through the middle of Sudan, starting from parts of Red Sea state and moving toward North Darfur state *(see Figure 345).*

FIGURE 343:
WASH: Uses improved drinking water sources (raster)

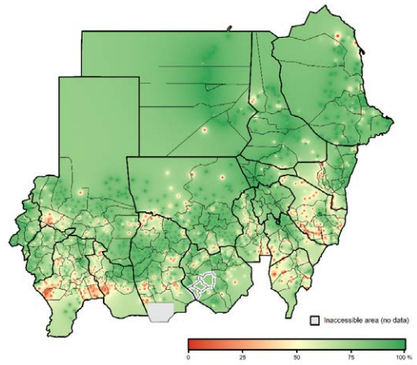


FIGURE 344:
WASH: Uses improved drinking water sources

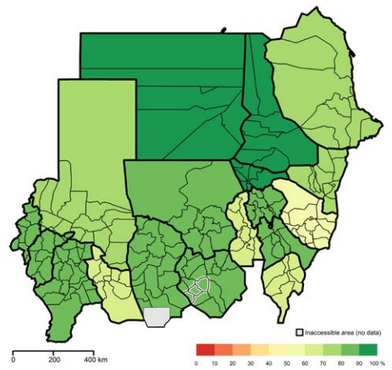


FIGURE 345:
WASH: Improved drinking water source within 30 minutes (raster)

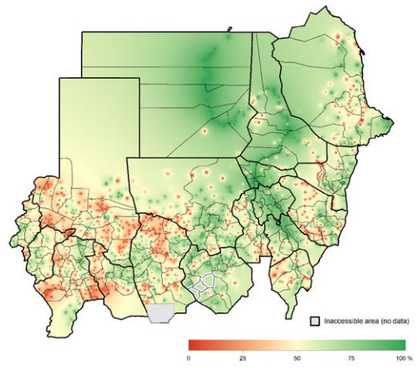
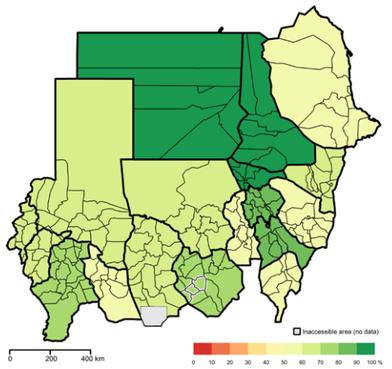


FIGURE 346:
WASH: Improved drinking water source within 30 minutes



3.20.2 Sanitation access

Improved access to toilet facilities average results

The proportion of households with access to improved toilet facilities was 37.4 per cent (95 per cent CI: 25.5-49.3) across the country. This estimate was roughly maintained even when non-sharing of improved toilet facilities was considered, with 30.5 per cent (95 per cent CI: 20.1-40.9) of access. Northern state had the highest proportion of households with access to improved toilet facilities, either shared or non-shared. On the other hand, South Kordofan had the lowest proportion of households with access to improved toilet facilities, and East Darfur had the lowest proportion of households with access to improved toilet facilities non-shared *(see Figure 347).*

The proportion of households using open defecation was high at 33.1 per cent (95 per cent CI: 20.4-45.8), with Red Sea state having the highest rate of open defecation of all states *(see Figure 347).* Across the localities, there was high variability in intra-state and inter-locality estimates for access to improved toilet facilities overall *(see Figure 348).* About 2.7 per cent of localities had no access to improved toilet facilities.

Table 107 and Table 108 present results by locality, by state and at the national level for access to improved toilet facilities.

FIGURE 347: Box plot of state results of improved toilet facilities

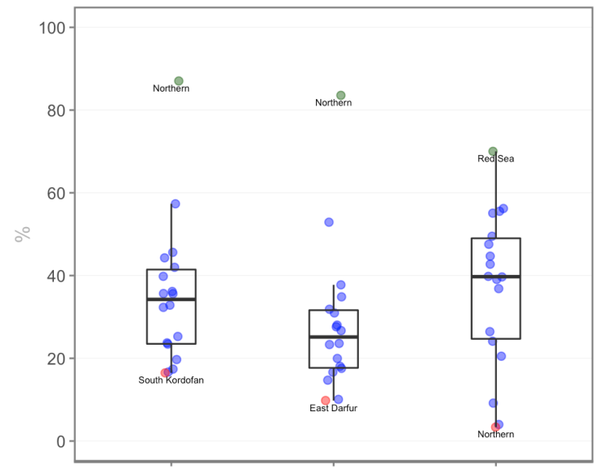


FIGURE 348: Box plot of locality results of improved drinking water sources

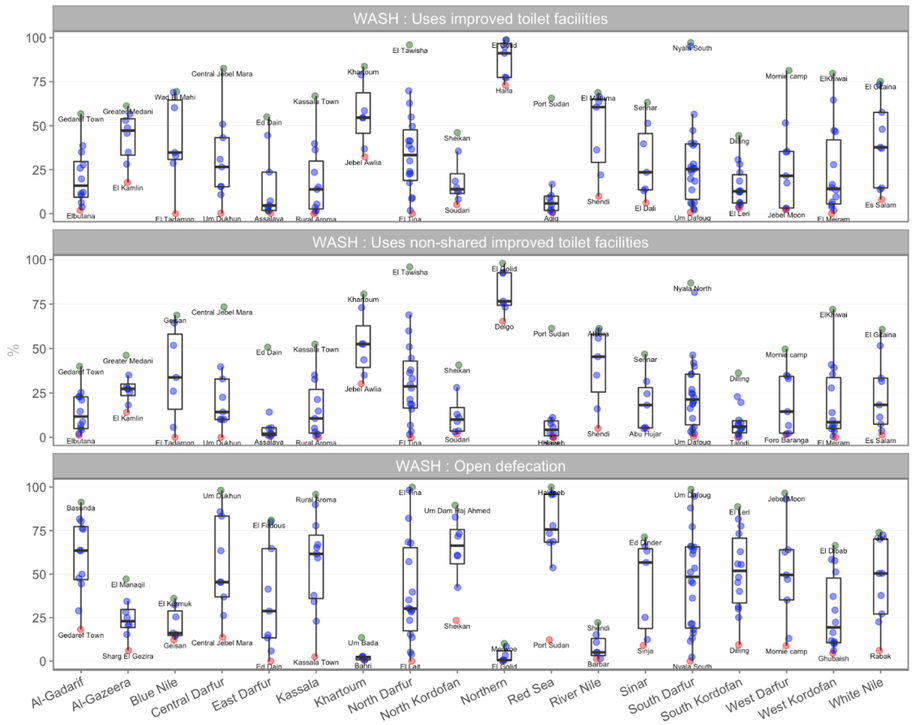


TABLE 107: Improved sanitation facilities by state and national

State	Improved toilet facilities %			Non-shared improved toilet facilities %			Open defecation %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	25.27	14.62	35.92	17.56	8.5	26.63	55.08	40.91	69.25
Al-Gazeera	42	26.85	57.15	27.61	16.84	38.37	26.44	10.8	42.08
Blue Nile	44.29	30.23	58.36	37.76	24.78	50.75	20.51	4.91	36.1
Central Darfur	32.85	19.19	46.51	26.69	14.38	39	55.54	38.31	72.77
East Darfur	17.4	8.82	25.97	9.79	3.15	16.43	39.08	25.77	52.39
Kassala	23.72	14.57	32.87	19.97	11.78	28.17	47.57	34.39	60.74
Khartoum	57.35	43.82	70.89	52.9	40.2	65.61	4.01	0.01	10.42
North Darfur	35.67	22.59	48.75	30.96	18.9	43.03	36.84	23.37	50.32
North Kordofan	23.42	14.06	32.78	18.06	9.86	26.25	56.22	44.02	68.41
Northern	87.04	77.25	96.83	83.55	73.59	93.51	3.36	0.01	7.66
Red Sea	16.67	8.89	24.45	14.72	7.06	22.38	70.02	58.92	81.11
River Nile	39.8	28.08	51.51	34.86	23.52	46.2	9.17	1.73	16.61
Sennar	35.62	25.18	46.06	23.6	15.52	31.67	39.8	27.94	51.67
South Darfur	36.15	26.54	45.75	31.85	21.69	42.01	42.75	27.23	58.26
South Kordofan	16.48	5.19	27.77	10.07	2.36	17.77	49.49	35.83	63.14
West Darfur	32.32	21.46	43.18	23.33	14.13	32.53	44.69	29.42	59.96
West Kordofan	19.7	8.56	30.84	16.64	6.37	26.91	24.13	13.25	35.01
White Nile	45.61	33.4	57.82	28.03	18.27	37.78	39.66	25.58	53.74
Sudan	37.42	25.48	49.35	30.26	19.85	40.68	33.34	20.63	46.05

TABLE 108: Improved sanitation facilities by locality and by state

Location	Improved toilet facilities %			Non-shared improved toilet facilities %			Open defecation %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	76.82	67.14	86.28	74.85	66.26	83.48	0.73	0.00	2.36
El Golid	98.75	97.07	99.80	97.68	95.62	98.99	0.00	0.00	0.64
Merwoe	75.69	58.51	89.26	76.47	60.19	88.22	9.88	3.01	18.79
El Daba	98.36	94.10	100.00	92.79	85.37	98.15	0.47	0.00	1.65
Halfa	72.95	55.37	89.91	71.02	51.14	87.99	3.42	1.09	6.49
Delgo	90.84	84.99	96.05	65.61	55.70	75.52	8.56	3.18	15.75
El Burgaig	94.60	86.43	98.54	92.52	84.54	98.10	0.61	0.00	2.67
Northern State	87.04	77.25	96.83	83.55	73.59	93.51	3.36	0.01	7.66
El Matama	69.72	51.34	85.10	58.55	40.84	75.24	1.49	0.21	3.16
Shendi	9.77	5.49	14.39	5.37	2.68	8.22	21.88	11.79	36.10

TABLE 108: Improved sanitation facilities by locality and by state

Location	Improved toilet facilities %			Non-shared improved toilet facilities %			Open defecation %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Hamad	21.23	10.13	36.20	16.06	6.65	25.88	10.79	3.84	23.40
Barbar	60.59	46.27	75.03	55.15	38.14	70.85	1.30	0.00	4.11
El Damar	36.58	26.71	46.09	34.25	25.99	43.78	5.34	1.39	10.99
Atbara	63.45	49.33	74.43	60.30	46.86	71.12	5.18	0.77	12.18
El Buhaira	66.95	58.39	74.63	46.05	35.55	55.42	15.13	7.86	23.71
River Nile State	39.8	28.08	51.51	34.86	23.52	46.2	9.17	1.73	16.61
Khartoum	80.77	72.97	87.53	77.50	70.06	84.90	0.61	0.00	2.67
Bahri	36.22	20.21	53.76	35.11	20.66	49.60	0.66	0.00	3.90
Um Durman	53.72	40.99	63.24	42.77	32.06	54.09	0.76	0.15	1.80
Um Bada	77.33	60.85	93.35	71.92	56.27	85.49	14.15	3.61	29.16
Jebel Awlia	32.07	21.30	42.91	29.30	18.61	39.31	2.87	0.23	7.16
Sharg Elneel	57.79	48.88	67.49	50.84	41.56	62.42	2.20	0.38	7.07
Karrari	54.97	38.60	69.68	51.31	34.74	65.62	2.53	0.19	7.09
Khartoum State	57.35	43.82	70.89	52.9	40.2	65.61	4.01	0.01	10.42
Greater Medani	59.90	47.00	71.26	44.82	34.98	53.39	14.73	5.09	25.59
Ganub Elgazira	44.42	32.11	56.56	34.07	22.50	44.53	26.25	10.46	41.41
El Hassahisa	26.92	15.66	41.23	17.86	8.76	30.84	19.78	10.54	32.62
El Kamlin	17.31	9.92	24.95	13.88	7.54	20.53	28.40	12.99	47.49
Sharg El Gezira	53.10	42.02	64.35	25.43	18.91	31.46	5.77	0.37	17.28
Um Elqura	47.52	34.39	64.27	24.80	17.82	34.22	33.33	20.63	49.00
El Manaqil	33.03	16.83	50.79	27.21	13.62	41.60	44.87	26.25	61.76
El Qurashi	52.06	35.05	67.61	25.75	16.98	34.66	20.43	6.12	36.13
Al-Gazeera State	42.00	26.85	57.15	27.61	16.84	38.37	26.44	10.80	42.08
Sennar	63.39	52.17	72.04	46.47	37.67	54.84	11.71	3.29	21.67
Sharg Sennar	23.99	15.72	31.47	17.99	10.38	26.90	64.08	54.67	74.75
Sinja	50.92	38.67	65.33	31.34	22.15	39.51	8.87	3.22	17.13
Abu Hujar	14.68	5.41	26.47	4.99	1.45	10.54	66.92	48.14	80.25
El Dali	6.44	1.14	15.98	5.39	0.74	13.73	56.60	39.53	73.21
Es Suki	39.48	26.16	53.06	24.80	14.63	37.58	24.59	13.51	39.39
Ed Dinder	13.48	7.34	21.78	5.15	2.29	8.95	70.64	59.66	81.94
Sennar State	35.62	25.18	46.06	23.60	15.52	31.67	39.80	27.94	51.67
Ed Damazine	36.02	23.94	48.09	32.92	19.86	47.60	14.46	6.79	25.76
El Tadamon	0.00	0.00	0.00	0.00	0.00	0.00	25.31	18.54	31.94
El Roseiris	59.75	46.57	73.84	51.20	39.04	64.04	15.14	6.80	25.01
Baw	32.65	18.52	44.94	26.18	15.62	36.77	32.33	7.33	59.23
Geisan	67.89	45.70	87.83	67.37	49.19	85.37	12.83	0.79	35.04
El Kurmuk	28.57	15.09	40.77	6.07	0.34	13.30	35.74	15.24	58.98
Wad El Mahi	69.74	51.39	87.96	64.72	46.59	80.51	16.44	3.99	33.67

TABLE 108: Improved sanitation facilities by locality and by state

Location	Improved toilet facilities %			Non-shared improved toilet facilities %			Open defecation %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Blue Nile State	44.29	30.23	58.36	37.76	24.78	50.75	20.51	4.91	36.10
Kosti	47.81	35.85	57.91	31.54	22.17	41.74	27.11	16.74	42.15
Guli	15.50	6.58	25.29	3.42	1.31	6.08	73.42	63.17	84.03
Tendalti	13.14	6.61	21.72	7.04	3.84	11.59	70.66	57.88	84.01
Es Salam	7.91	2.93	13.76	1.38	0.38	2.85	70.67	51.75	88.21
Rabak	72.67	61.50	81.66	50.39	40.23	59.83	6.16	0.90	16.07
El Jabalain	38.75	22.73	55.24	18.44	8.12	30.31	51.34	32.97	66.35
El Diwaim	36.96	25.90	49.83	11.63	4.11	20.44	49.21	31.19	66.08
Um Rimta	56.88	43.30	68.77	34.12	24.28	43.46	37.18	25.64	51.83
El Gitaina	75.00	61.04	86.67	61.21	47.25	73.79	23.15	9.20	36.62
White Nile State	45.61	33.40	57.82	28.03	18.27	37.78	39.66	25.58	53.74
Port Sudan	65.83	50.16	78.95	61.71	46.55	75.31	12.41	2.87	25.49
Swakin	10.35	0.61	20.28	10.47	1.02	22.29	69.26	49.54	84.46
El Gonob Welawlaib	8.60	2.92	15.66	7.93	1.67	15.00	73.21	58.56	86.71
Sinkat	6.50	1.75	12.33	5.41	1.19	10.67	78.22	60.26	93.03
Haya	1.58	0.00	4.06	0.00	0.00	0.00	95.04	90.20	98.41
Dordieb	2.34	0.21	5.72	2.31	0.22	5.28	96.13	91.13	99.41
Tokar	5.15	1.14	9.89	2.67	0.58	6.26	68.15	55.35	81.05
Agig	0.44	0.00	2.58	0.43	0.00	1.92	96.32	92.99	98.93
Gabaot Elma-aadin	16.21	8.50	25.54	10.95	3.87	19.23	51.61	40.00	64.41
Halaeeb (accessible parts)	0.00	0.00	4.92	0.00	0.00	0.00	94.12	85.29	99.15
Red Sea State	16.67	8.89	24.45	14.72	7.06	22.38	70.02	58.92	81.11
Kassala Town	66.99	51.70	78.72	52.12	41.54	62.48	2.45	0.00	7.98
Refi Kassla	13.85	9.21	19.30	10.44	5.81	15.86	66.31	50.97	79.35
Rural Western Kassala	3.78	0.18	9.53	3.10	0.20	9.12	59.76	46.52	70.95
New Halfa	40.10	31.11	47.78	35.36	26.63	44.04	22.53	12.10	36.37
Refi Nahr Atbara	0.84	0.00	2.10	0.84	0.00	2.10	34.03	20.17	50.75
Rural Khashm Elgirba	23.00	11.88	36.76	22.92	12.04	34.23	67.16	47.86	84.26
Rural Wad Elhilaiw	36.83	20.15	54.26	33.12	17.92	50.17	61.53	44.34	76.61
Rural Aroma	0.00	0.00	4.35	0.00	0.00	4.26	96.01	85.93	100.00
Refi North Delta	5.25	0.00	16.78	5.05	0.22	16.09	90.75	79.20	100.00
Refi Hamashkureib	1.78	0.20	4.21	1.90	0.19	4.30	36.82	20.03	54.80
Rural Telkok	15.58	9.13	22.10	15.02	8.03	22.18	77.63	70.51	85.07
Kassala State	23.72	14.57	32.87	19.97	11.78	28.17	47.57	34.39	60.74
Gedaref Town	56.55	41.36	70.80	39.87	27.68	51.62	18.32	6.57	37.34
Middle Geddaref	38.49	21.77	54.83	23.25	10.97	38.41	28.26	11.91	48.28

TABLE 108: Improved sanitation facilities by locality and by state

Location	Improved toilet facilities %			Non-shared improved toilet facilities %			Open defecation %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Elbutana	1.89	0.36	5.18	1.11	0.00	3.97	81.48	74.44	87.99
El Fashaga	26.58	13.38	44.73	21.53	10.00	35.84	49.13	31.35	68.74
El Rahad	35.89	24.90	44.94	24.75	16.69	33.37	44.96	31.18	56.84
Gala-a El Nahal	10.54	2.55	20.47	6.41	1.62	13.11	64.27	41.66	85.29
El Fao	12.23	7.10	18.39	5.29	2.28	9.54	75.75	67.90	82.80
El Qureisha	27.93	17.05	40.44	22.69	12.43	33.34	63.13	49.02	76.84
El Mafaza	11.78	4.81	19.02	9.17	4.18	15.09	47.08	30.48	64.37
Basunda	5.99	0.94	16.61	5.41	0.72	14.76	91.71	82.00	97.11
Western Galabat	3.82	1.20	8.68	1.89	0.40	4.70	80.53	66.53	89.80
Eastern Galabat	19.89	11.74	30.22	14.71	8.61	22.72	76.18	64.34	85.15
Al-Gadarif State	25.27	14.62	35.92	17.56	8.50	26.63	55.08	40.91	69.25
Sheikan	46.26	36.20	57.38	40.77	30.12	50.01	22.33	14.16	32.14
Um Rawaba	15.09	7.89	24.04	11.43	4.17	21.77	60.12	48.38	71.16
Um Dam Haj Ahmed	8.08	3.45	15.57	3.38	0.20	9.11	88.67	78.79	95.27
El Rahad	18.41	9.81	27.15	12.56	5.37	20.87	60.21	39.85	77.88
Bara	12.59	6.52	21.17	8.96	4.21	16.20	71.40	58.83	81.89
Gharb Bara	36.50	22.22	51.59	27.96	17.78	40.14	43.91	28.41	58.26
Soudari	4.88	1.68	10.32	1.84	0.00	4.93	81.48	70.59	90.50
Gebrat El Sheikh	12.95	4.84	22.91	3.19	0.72	6.50	73.63	63.05	82.64
North Kordofan State	23.42	14.06	32.78	18.06	9.86	26.25	56.22	44.02	68.41
Kadugli	29.95	22.18	38.55	23.09	16.77	29.28	24.67	17.09	34.63
Reif Shargi	23.73	13.76	35.02	8.21	3.67	13.80	31.74	20.49	47.29
Dilling	44.14	24.35	62.26	36.39	20.44	52.09	9.32	2.90	20.16
El Quoz	18.27	10.00	28.86	9.42	4.37	17.66	40.47	26.30	53.24
Habila	12.32	6.15	18.36	7.62	3.91	12.16	54.99	43.71	65.14
Abassiya	12.57	4.74	27.15	5.09	2.13	9.15	55.49	39.16	71.12
El Rashad	12.24	4.01	25.07	5.35	0.97	14.77	48.74	34.78	61.29
Abu Jubaiha	6.49	0.75	15.93	4.59	0.56	11.29	77.46	65.29	85.99
El Tadamon	4.08	0.96	8.74	1.89	0.58	3.65	63.33	42.13	83.55
Talodi	4.93	0.00	15.00	0.00	0.00	7.92	73.43	54.27	88.89
Ghadeer	5.80	0.94	14.29	2.33	0.00	6.20	81.61	72.72	89.23
El Leri	2.96	0.82	6.21	0.42	0.00	1.86	88.87	81.30	93.75
Abu Karshola	13.87	1.89	28.31	7.16	0.42	18.54	29.14	14.92	44.52
Delami	27.41	12.54	41.39	19.53	7.84	30.53	44.88	30.88	62.35
South Kordofan State	16.48	5.19	27.77	10.07	2.36	17.77	49.49	35.83	63.14
Abu Zabad	44.92	29.04	60.41	37.96	23.05	54.22	10.70	3.64	19.93

TABLE 108: Improved sanitation facilities by locality and by state

Location	Improved toilet facilities %			Non-shared improved toilet facilities %			Open defecation %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
ElKhiwai	79.79	58.68	95.66	73.57	51.99	87.94	10.71	2.91	24.30
Ghubaish	3.67	0.00	10.44	3.29	0.00	9.62	4.41	0.99	10.03
El Nuhud	5.23	2.14	9.72	4.84	1.88	8.97	22.49	13.03	33.21
El Idia	6.76	2.47	13.75	5.12	1.20	11.39	6.29	1.71	12.48
Wad Benda	26.83	12.15	43.97	28.35	13.85	45.40	11.38	6.14	18.83
Lagawa	2.01	0.00	5.00	0.54	0.00	1.90	57.92	44.86	71.89
Elsunut	16.35	8.39	29.37	13.94	6.13	26.53	57.61	40.25	74.70
Keilik	65.20	50.96	75.01	36.00	27.98	44.24	28.97	21.63	40.57
Es Salam	46.37	33.04	58.89	40.86	28.95	51.46	16.00	7.70	26.63
Babanusa	9.59	4.90	14.87	6.64	3.29	10.33	10.09	4.11	18.06
Abyei	14.70	1.99	31.52	9.71	1.94	20.48	37.53	23.62	53.00
El Dibab	13.54	2.01	27.62	7.78	1.07	17.62	67.88	49.65	85.67
El Meiram	0.00	0.00	2.45	0.00	0.00	2.28	49.72	33.11	68.35
West Kordofan State	19.70	8.56	30.84	16.64	6.37	26.91	24.13	13.25	35.01
El Fasher	43.04	34.99	52.53	35.15	26.47	43.39	17.45	9.19	27.05
Tawila	16.09	5.05	28.62	13.71	4.05	25.62	60.65	40.12	77.52
Melit	29.47	17.28	40.99	28.85	16.83	40.70	64.84	52.53	78.08
Um Kadada	20.57	13.64	28.16	19.59	12.31	27.34	33.05	20.98	46.59
Kebkabiya	21.87	9.29	34.88	19.60	8.02	31.66	14.86	6.68	27.63
Kutum	39.15	27.12	49.91	37.84	26.64	48.41	29.42	14.57	48.27
El Mahalha	69.19	46.38	84.93	69.66	45.64	87.36	28.18	12.00	50.16
Saraf Omra	24.24	8.05	43.98	18.79	6.40	34.76	32.06	16.95	47.12
El Serief	9.01	3.69	14.39	3.18	1.49	5.52	57.27	49.35	65.93
Dar Elsalam	39.06	26.66	50.69	26.12	18.30	34.23	23.45	8.68	41.75
Kelemando	35.14	23.66	47.04	34.99	24.45	46.77	38.40	23.55	51.88
El Tawisha	91.68	85.07	95.14	91.54	84.43	94.95	3.65	0.96	9.57
Um Baru	1.77	0.00	5.18	1.66	0.00	4.70	97.98	94.81	100.00
El Lait	55.51	47.10	64.75	54.12	43.83	61.87	0.00	0.00	0.39
ELkuma	47.67	16.48	75.74	47.41	16.83	74.39	11.67	0.00	44.00
El Tina	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00
Kernoi	8.22	3.42	14.09	6.82	3.25	10.70	80.91	75.16	86.59
North Darfur State	35.67	22.59	48.75	30.96	18.90	43.03	36.84	23.37	50.32
Nyala South	97.41	95.32	99.05	81.35	73.42	88.23	0.00	0.00	0.00
Nyala North	95.10	87.96	100.00	86.11	72.62	98.49	2.11	0.00	8.87
Es Salam	25.04	18.62	31.23	20.10	14.24	25.93	52.11	38.11	63.73
El Wihda	39.13	30.26	47.82	36.00	27.05	46.31	17.82	7.85	32.12
Mershing	39.63	31.04	46.58	34.78	28.32	40.41	11.49	3.73	21.89

TABLE 108: Improved sanitation facilities by locality and by state

Location	Improved toilet facilities %			Non-shared improved toilet facilities %			Open defecation %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Beliel	48.84	39.49	58.75	36.60	27.51	45.17	29.76	21.11	39.74
Nitega	24.74	17.57	31.10	24.68	16.94	31.60	35.18	20.70	54.77
Sharg El Jabal (accessible parts)	40.00	13.33	66.67	40.00	20.00	66.67	13.33	0.00	33.33
Kas	23.94	11.88	37.23	18.39	9.16	29.63	65.43	48.04	80.58
Shattaya	6.09	2.47	10.55	5.75	2.41	9.63	87.86	78.77	95.81
Buram	20.43	10.49	32.01	19.37	9.98	29.94	61.63	42.29	79.51
Gereida	28.17	18.15	37.36	27.04	17.18	36.33	15.60	4.14	37.43
El Sunta	5.68	0.84	13.94	3.12	0.85	7.10	94.62	85.80	98.86
El Radoum	13.10	5.95	22.65	11.13	4.63	18.19	65.82	47.80	81.87
Tulus	46.39	28.93	63.65	45.60	28.57	63.29	19.21	3.24	54.40
Damso	26.62	12.01	40.82	26.04	11.47	37.35	53.24	32.15	77.62
Ed Elfursan	2.31	0.00	8.63	2.36	0.00	9.26	64.71	49.46	78.61
Kubum	25.03	17.57	31.25	21.96	13.82	29.37	44.27	30.59	62.20
Kateila	2.08	0.45	5.07	2.16	0.46	5.33	45.95	26.55	61.81
Rehaid Elbirdi	17.86	9.45	28.42	15.51	6.73	25.95	64.48	48.77	81.06
Um Dafoug	0.73	0.00	2.47	0.74	0.00	2.48	98.52	95.34	100.00
South Darfur State	36.15	26.54	45.75	31.85	21.69	42.01	42.75	27.23	58.26
Abu Jabra	1.25	0.00	4.80	1.01	0.00	3.87	39.51	23.73	57.26
Abu Karinka	22.31	10.73	36.70	14.00	6.52	21.96	14.62	2.59	31.73
Bahr El Arab	6.65	1.26	18.28	4.84	0.00	14.57	80.56	65.84	93.00
Adila	44.75	35.81	51.63	5.77	2.55	11.33	5.15	0.00	17.82
Ed Dain	53.29	43.09	63.16	49.82	39.75	58.35	0.00	0.00	2.13
Assalaya	0.51	0.00	3.78	0.00	0.00	2.35	64.17	51.21	80.01
El Firdous	3.76	1.14	6.55	0.89	0.00	2.47	81.36	69.36	91.75
Shia-ria	1.78	0.29	4.16	1.82	0.49	3.88	14.14	4.29	27.74
Yassin	4.42	1.82	8.76	1.98	0.32	4.45	27.73	13.07	43.97
East Darfur State	17.40	8.82	25.97	9.79	3.15	16.43	39.08	25.77	52.39
El Geneina	51.31	39.16	63.23	34.42	26.07	42.54	12.78	4.62	25.37
Habila	2.77	0.21	6.65	2.59	0.00	6.23	93.44	85.06	98.60
Kulbus	17.93	6.32	29.32	15.37	5.12	26.69	63.12	40.30	82.25
Beida	35.58	24.00	49.25	35.30	22.59	47.20	36.32	14.67	57.70
Foro Baranga	3.15	1.06	5.90	1.58	0.36	3.35	47.02	25.44	67.31
Kereneik	63.84	51.75	74.45	36.75	27.26	45.49	24.92	14.76	35.45
Sirba	34.92	21.12	49.38	32.08	17.41	44.61	49.43	34.71	65.23
Jebel Moon	2.24	0.00	5.98	2.01	0.00	5.68	95.74	91.18	99.08
West Darfur State	32.32	21.46	43.18	23.33	14.13	32.53	44.69	29.42	59.96
Zalingi	30.09	19.31	43.00	22.93	12.77	32.69	36.74	24.56	51.08

TABLE 108: Improved sanitation facilities by locality and by state

Location	Improved toilet facilities %			Non-shared improved toilet facilities %			Open defecation %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Wadi Salih	43.75	25.46	61.72	32.53	20.47	45.36	44.02	27.86	62.75
Mukjar	11.04	0.00	24.33	8.77	0.00	22.87	80.27	59.12	100.00
Central Jebel Mara	82.48	72.49	90.54	73.33	61.68	85.31	13.73	6.99	21.05
North Jebel Mara	15.60	2.90	29.35	9.66	0.69	21.48	83.33	68.39	95.81
Bendasi	50.54	22.46	77.50	39.80	15.87	61.08	45.36	16.10	75.33
Nertiti	26.42	16.37	37.20	10.06	5.54	14.76	26.36	10.11	46.43
Azum	14.86	5.58	25.08	13.92	4.75	24.18	62.28	41.97	82.00
Um Dukhun	0.18	0.00	5.42	0.00	0.00	3.20	96.58	89.12	98.90
Central Darfur State	32.85	19.19	46.51	26.69	14.38	39.00	55.54	38.31	72.77

Spatial distribution of improved access to toilet facilities

There were low estimates of the proportion of households with improved access to toilet facilities, shared or non-shared, evenly spread throughout the east, west and south of Sudan, and a large number of areas of high estimates in the north, predominantly in Northern state *(see Figure 349 and Figure 351)*. The spatial trend for open defecation was the reverse of the pattern for the two previous indicators *(see Figure 353)*.

FIGURE 349:
WASH: Uses improved toilet facilities (raster)

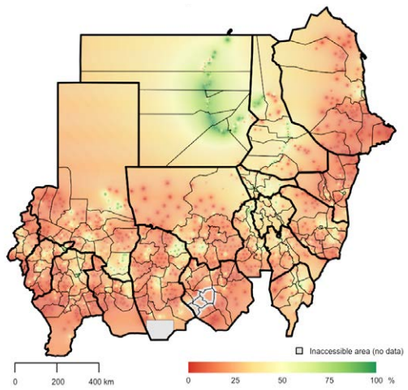


FIGURE 350:
WASH: Uses improved toilet facilities

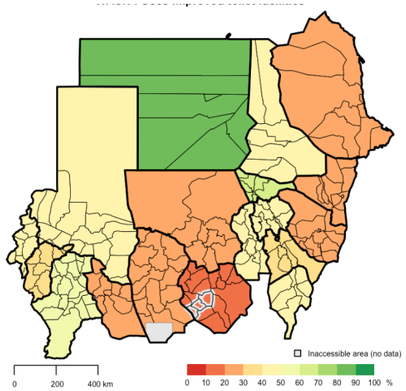


FIGURE 351:
WASH: Uses non-shared Improved toilet facilities (raster)

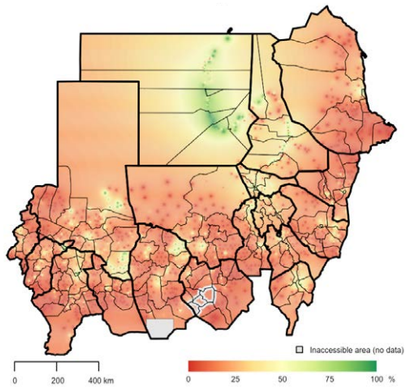


FIGURE 352:
WASH: Uses non-shared improved toilet facilities

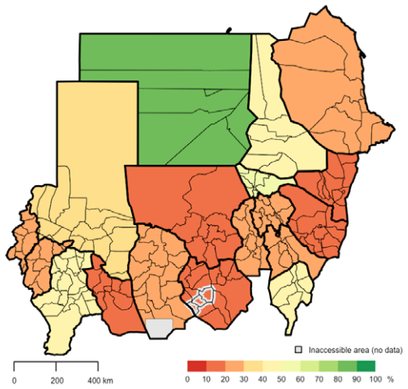


FIGURE 353:
WASH: Open defecation (raster)

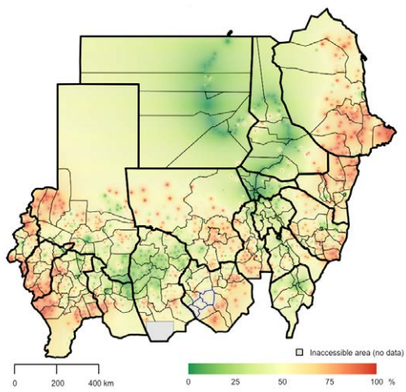
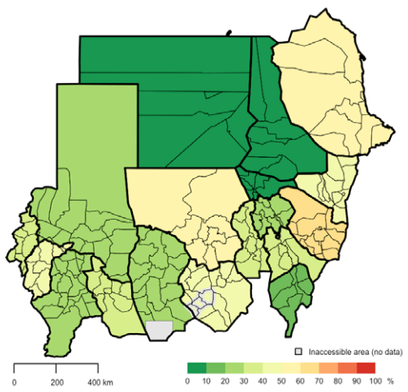


FIGURE 354:
WASH: Open defecation



3.20.3 Hand-washing facilities access

Hand-washing facilities access average results

The proportion of households with access to basic hand-washing facilities was low at 14.3 per cent (95 per cent CI: 6.8-21.8). Northern state had the highest proportion of access to hand-washing facilities, while South Kordofan had the lowest proportion among the states *(see Figure 355)*.

Across the localities, there was high variability in intra-state and inter-locality estimates for access to basic hand-washing facilities *(see Figure 355)*. In about 5.4 per cent of localities, at least 50 per cent of households had access to basic hand-washing facilities.

Table 109 and Table 110 present results by locality, by state and at the national level for access to basic hand-washing facilities.

FIGURE 355: Box plot of state and locality results for basic hand-washing facilities

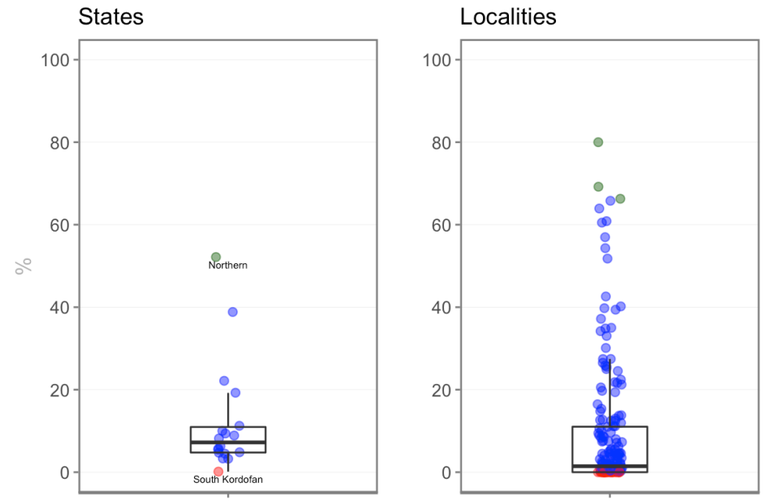


TABLE 109: Basic hand-washing facilities by state and national

State	Basic Handwashing Facilities		
	Estimate	95% LCL	95% UCL
Al-Gadarif	5.69	0.01	13.33
Al-Gazeera	8.86	3.56	14.17
Blue Nile	3.36	0.01	7.35
Central Darfur	4.87	0.01	10.36
East Darfur	11.28	5.23	17.32
Kassala	9.99	4.53	15.44
Khartoum	38.84	26.20	51.48
North Darfur	3.26	0.11	6.41
North Kordofan	4.73	1.14	8.32
Northern	52.13	39.54	64.71
Red Sea	4.48	0.01	10.81
River Nile	22.15	13.31	31.00
Sennar	9.41	3.61	15.20
South Darfur	8.14	2.08	14.20
South Kordofan	0.12	0.01	0.63
West Darfur	5.51	1.12	9.91
West Kordofan	6.30	0.18	12.42
White Nile	19.23	12.05	26.41
Sudan	14.26	6.76	21.77

TABLE 110: Basic hand-washing facilities by locality and by state

Location	Basic Handwashing Facilities		
	Estimate	95% LCL	95% UCL
Dongola	68.23	58.97	76.07
El Golid	60.29	51.96	70.00
Merwoe	65.00	49.41	81.43
El Daba	39.44	26.51	49.65
Halfa	37.71	25.53	45.27
Delgo	19.67	10.20	30.16
El Burgaig	33.95	25.86	44.70
Northern State	52.13	39.54	64.71
El Matama	11.20	4.57	21.24
Shendi	3.45	0.81	6.90
Abu Hamad	7.62	1.62	15.87
Barbar	26.54	17.19	39.68
El Damar	34.34	23.96	44.78
Atbara	57.36	42.19	69.30
El Buhaira	11.87	4.75	19.81
River Nile State	22.15	13.31	31.00
Khartoum	63.62	55.22	73.04
Bahri	30.12	16.41	42.72
Um Durman	20.59	11.26	33.17
Um Bada	61.44	47.33	75.57
Jebel Awlia	20.86	9.30	35.03
Sharg Elneel	15.62	7.08	24.43
Karrari	54.67	42.29	66.89
Khartoum State	38.84	26.20	51.48
Greater Medani	33.82	23.90	45.46
Ganub Elgazira	8.40	4.16	13.21
El Hassahisa	8.13	3.74	14.26
El Kamlin	4.33	1.85	7.32
Sharg El Gezira	8.31	3.57	14.50
Um Elqura	6.00	2.67	9.45
El Manaqil	4.43	1.50	7.81
El Qurashi	1.04	0.00	3.71
Al-Gazeera State	8.86	3.56	14.17
Sennar	20.70	13.18	29.15
Sharg Sennar	13.23	6.75	19.69
Sinja	13.00	6.81	20.91
Abu Hujar	0.38	0.00	1.79
El Dali	2.85	0.00	9.67
Es Suki	3.96	0.60	8.61

TABLE 110: Basic hand-washing facilities by locality and by state

Location	Basic Handwashing Facilities		
	Estimate	95% LCL	95% UCL
Ed Dinder	0.00	0.00	0.00
Sennar State	9.41	3.61	15.20
Ed Damazine	5.19	1.28	11.53
El Tadamon	0.00	0.00	0.00
El Roseiris	0.13	0.00	0.68
Baw	16.52	9.09	23.16
Geisan	0.00	0.00	0.00
El Kurmuk	0.00	0.00	0.00
Wad El Mahi	0.00	0.00	0.00
Blue Nile State	3.36	0.01	7.35
Kosti	4.42	0.45	9.87
Guli	10.08	3.75	18.71
Tendalti	1.52	0.00	4.22
Es Salam	14.34	4.98	25.73
Rabak	39.29	31.02	48.72
El Jabalain	0.38	0.00	1.91
El Diwaim	7.11	2.35	13.18
Um Rimta	26.68	19.32	34.99
El Gitaina	66.53	53.75	78.19
White Nile State	19.23	12.05	26.41
Port Sudan	13.42	4.54	29.80
Swakin	10.78	0.43	23.59
El Gonob Welawlaib	0.00	0.00	0.00
Sinkat	1.33	0.21	3.10
Haya	1.37	0.00	4.02
Dordieb	0.00	0.00	0.00
Tokar	0.00	0.00	1.32
Agig	3.26	1.07	6.89
Gabaot Elma-aadin	25.21	16.61	36.69
Halaeeb (accessible parts)	0.00	0.00	0.00
Red Sea State	4.48	0.01	10.81
Kassala Town	39.45	29.32	51.34
Refi Kassla	2.09	0.00	7.07
Rural Western Kassala	0.00	0.00	0.87
New Halfa	24.92	17.25	32.26
Refi Nahr Atbara	0.00	0.00	0.63
Rural Khashm Elgirba	0.21	0.00	1.26
Rural Wad Elhilaiw	0.17	0.00	1.01

TABLE 110: Basic hand-washing facilities by locality and by state

Location	Basic Handwashing Facilities		
	Estimate	95% LCL	95% UCL
Rural Aroma	0.00	0.00	0.00
Refi North Delta	0.00	0.00	0.00
Refi Hamashkureib	0.00	0.00	0.00
Rural Telkok	0.00	0.00	0.00
Kassala State	9.99	4.53	15.44
Gedaref Town	9.48	2.15	20.92
Middle Geddaref	4.40	0.00	14.87
Elbutana	0.00	0.00	0.00
El Fashaga	0.00	0.00	0.00
El Rahad	2.04	0.00	7.97
Gala-a El Nahal	7.23	0.00	18.81
El Fao	0.53	0.00	1.79
El Qureisha	0.00	0.00	0.00
El Mafaza	23.88	12.36	38.64
Basunda	1.88	0.00	4.12
Western Galabat	5.51	1.14	11.87
Eastern Galabat	2.01	0.18	6.10
Al-Gadarif State	5.69	0.01	13.33
Sheikan	10.76	6.24	15.95
Um Rawaba	5.25	1.95	9.35
Um Dam Haj Ahmed	4.28	0.82	10.56
El Rahad	2.01	0.00	5.02
Bara	2.12	0.71	4.75
Gharb Bara	0.56	0.00	1.79
Soudari	0.46	0.00	1.57
Gebrat El Sheikh	0.37	0.00	1.30
North Kordofan State	4.73	1.14	8.32
Kadugli	0.25	0.00	1.16
Reif Shargi	0.00	0.00	0.00
Dilling	0.38	0.00	1.97
El Quoz	0.00	0.00	0.00
Habila	0.00	0.00	0.00
Abassiya	0.39	0.00	1.37
El Rashad	0.00	0.00	0.00
Abu Jubaiha	0.00	0.00	0.00
El Tadamon	0.00	0.00	0.00
Talodi	0.00	0.00	0.00
Ghadeer	0.00	0.00	0.00
El Leri	0.00	0.00	0.00

TABLE 110: Basic hand-washing facilities by locality and by state

Location	Basic Handwashing Facilities		
	Estimate	95% LCL	95% UCL
Abu Karshola	0.21	0.00	1.05
Delami	0.00	0.00	0.00
South Kordofan State	0.12	0.01	0.63
Abu Zabad	20.35	6.57	35.70
ElKhiwai	4.00	1.68	6.92
Ghubaish	4.10	1.62	7.73
El Nuhud	3.26	1.03	6.16
El Idia	1.35	0.00	4.09
Wad Benda	8.99	3.29	15.34
Lagawa	0.00	0.00	0.00
Elsunut	25.59	12.91	40.39
Keilik	0.00	0.00	0.00
Es Salam	7.04	3.31	11.80
Babanusa	0.00	0.00	0.00
Abyei	1.00	0.00	2.72
El Dibab	0.00	0.00	0.00
El Meiram	0.00	0.00	0.00
West Kordofan State	6.30	0.18	12.42
El Fasher	6.73	3.14	11.08
Tawila	0.75	0.00	2.40
Melit	0.00	0.00	0.82
Um Kadada	31.08	21.94	39.17
Kebkabiya	0.73	0.00	2.44
Kutum	1.35	0.19	3.28
El Mahalha	0.00	0.00	0.00
Saraf Omra	0.00	0.00	0.00
El Serief	0.00	0.00	0.00
Dar Elsalam	1.56	0.00	4.69
Kelemando	0.00	0.00	0.00
El Tawisha	1.86	0.51	3.88
Um Baru	0.00	0.00	0.00
El Lait	0.00	0.00	0.00
ELkuma	0.00	0.00	0.00
El Tina	0.00	0.00	0.00
Kernoi	0.37	0.00	1.71
North Darfur State	3.26	0.11	6.41
Nyala South	42.82	32.92	51.97
Nyala North	24.29	11.28	42.24
Es Salam	2.39	0.16	6.44

TABLE 110: Basic hand-washing facilities by locality and by state

Location	Basic Handwashing Facilities		
	Estimate	95% LCL	95% UCL
El Wihda	0.00	0.00	0.00
Mershing	11.32	3.82	18.34
Beliel	2.83	1.60	4.25
Nitega	10.80	5.63	15.36
Sharg El Jabal (accessible parts)	80.00	60.00	100.00
Kas	0.00	0.00	0.00
Shattaya	0.00	0.00	0.00
Buram	0.00	0.00	0.00
Gereida	0.00	0.00	0.00
El Sunta	0.57	0.00	1.72
El Radoum	14.89	7.83	23.45
Tulus	0.00	0.00	1.59
Damso	0.00	0.00	0.00
Ed Elfursan	0.00	0.00	0.00
Kubum	0.00	0.00	0.00
Kateila	0.00	0.00	0.00
Rehaid Elbirdi	0.00	0.00	0.00
Um Dafoug	0.00	0.00	0.00
South Darfur State	8.14	2.08	14.20
Abu Jabra	0.00	0.00	2.01
Abu Karinka	1.07	0.00	2.67
Bahr El Arab	2.85	0.00	6.96
Adila	52.17	42.84	59.72
Ed Dain	26.47	17.46	37.22
Assalaya	4.57	0.80	9.58
El Firdous	2.26	0.00	6.74
Shia-ria	0.00	0.00	0.00
Yassin	7.17	1.43	16.93
East Darfur State	11.28	5.23	17.32
El Geneina	12.77	7.01	19.56
Habila	0.00	0.00	0.00
Kulbus	0.00	0.00	0.00
Beida	0.00	0.00	3.60
Foro Baranga	0.00	0.00	0.00
Kereneik	9.77	6.93	13.25
Sirba	5.27	0.18	12.56
Jebel Moon	0.00	0.00	0.00
West Darfur State	5.51	1.12	9.91

TABLE 110: Basic hand-washing facilities by locality and by state

Location	Basic Handwashing Facilities		
	Estimate	95% LCL	95% UCL
Zalingi	7.51	1.78	14.78
Wadi Salih	21.53	10.67	31.61
Mukjar	0.00	0.00	0.00
Central Jebel Mara	0.00	0.00	0.00
North Jebel Mara	4.73	0.00	12.76
Bendasi	0.00	0.00	0.00
Nertiti	0.00	0.00	0.00
Azum	0.00	0.00	2.00
Um Dukhun	0.18	0.00	10.82
Central Darfur State	4.87	0.01	10.36

Spatial distribution of hand-washing facilities access

Low access to basic hand-washing facilities was evenly spread throughout Sudan with small pockets of high access in Northern state *(see Figure 356)*.

FIGURE 356:
WASH: Has basic hand-washing facilities (raster)

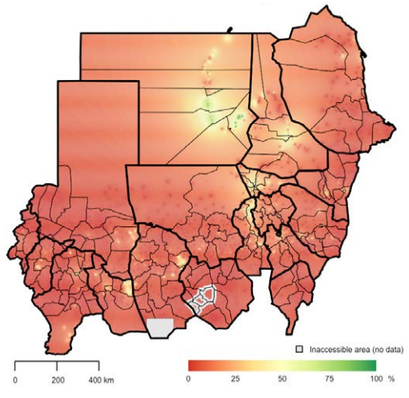
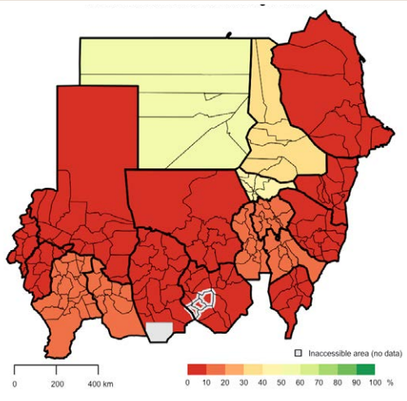


FIGURE 357:
WASH: Has basic hand-washing facilities



3.20.4 Knowledge of hand-washing practices

Knowledge of hand-washing practices average results

In response to a survey question about their knowledge of important hand-washing events, the mean number of events identified by carers was 2.4 (95 per cent CI: 2.2-2.7) out of the total 5 events recommended by health practitioners. The proportion of carers who were able to identify all 5 critical hand-washing events was 7.4 per cent (95 per cent CI: 2.0-12.8). There was low variability in inter-state results for both indicators *(see Figure 358)*. No carers were able to identify all five critical hand-washing events in about 16.8 per cent of localities.

Table 111 and Table 112 present results by locality, by state and at the national level for mean number of hand-washing events identified and the proportion of carers who identified all five key hand-washing events.

FIGURE 358: Box plot of state results for hand-washing practices

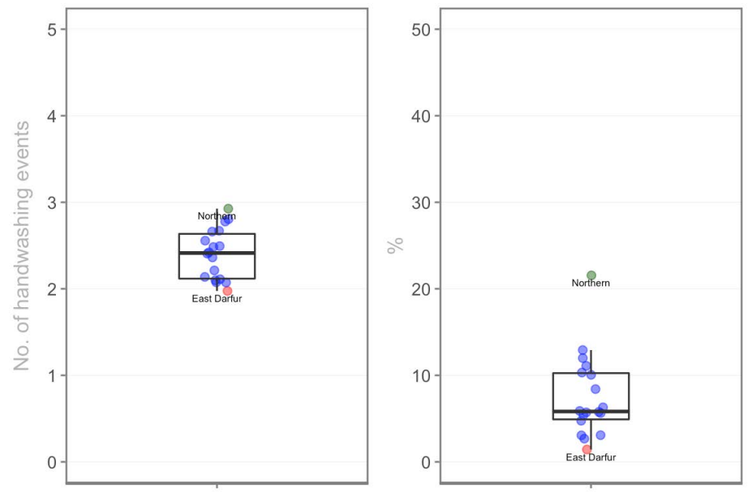


FIGURE 359: Box plot of locality results for hand-washing practices

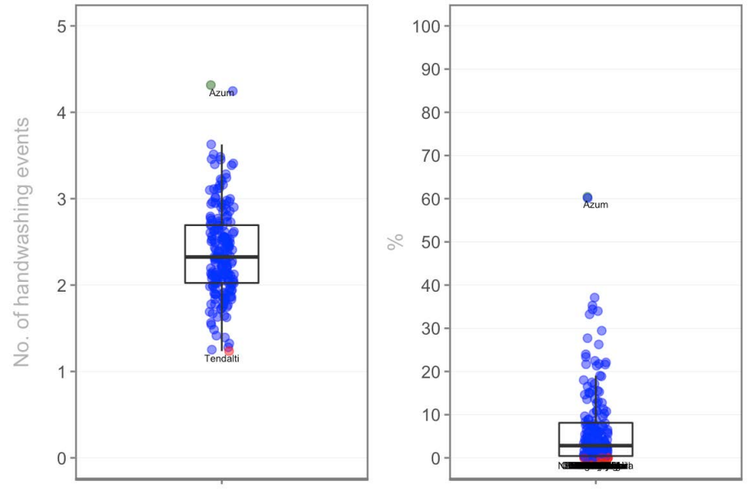


TABLE 111: Hand-washing practices by state and national

State	Number of Appropriate Hand-washing Events Identified			Identified 5 Key Hand-washing Times %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	2.42	2.15	2.69	5.88	1.51	10.24
Al-Gazeera	2.21	1.99	2.44	3.08	0.01	6.43
Blue Nile	2.78	2.51	3.04	11.99	5.10	18.88
Central Darfur	2.14	1.93	2.35	5.39	2.69	8.08
East Darfur	1.97	1.79	2.16	1.43	0.01	3.27
Kassala	2.80	2.58	3.03	10.06	4.37	15.75
Khartoum	2.66	2.39	2.93	10.32	3.93	16.71
North Darfur	2.41	2.16	2.65	8.41	3.78	13.04
North Kordofan	2.56	2.24	2.87	12.92	4.65	21.20
Northern	2.93	2.60	3.26	21.55	10.11	32.98
Red Sea	2.36	2.06	2.67	4.75	0.01	9.87
River Nile	2.48	2.21	2.76	11.10	5.60	16.59
Sennar	2.11	1.86	2.36	6.30	0.89	11.72
South Darfur	2.49	2.25	2.74	5.77	1.67	9.88
South Kordofan	2.10	1.74	2.45	2.68	0.01	7.29
West Darfur	2.67	2.44	2.90	5.64	0.88	10.41
West Kordofan	2.07	1.77	2.38	5.72	0.52	10.93
White Nile	2.08	1.86	2.29	3.07	0.01	6.16
Sudan	2.42	2.16	2.68	7.34	1.95	12.73

TABLE 112: Hand-washing practices by locality and by state

Location	Number of Appropriate Handwashing Events Identified			Identified 5 Key Handwashing Times %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	2.57	2.29	2.96	12.57	4.32	24.92
El Golid	2.92	2.65	3.28	23.88	12.10	38.08
Merwoe	4.21	3.74	4.63	58.72	41.38	74.66
El Daba	2.51	2.28	2.74	6.37	1.86	12.27
Halfa	2.90	2.72	3.11	9.14	3.42	16.33
Delgo	2.85	2.57	3.06	16.01	8.94	23.71
El Burgaig	2.03	1.77	2.35	3.13	0.00	8.74
Northern State	2.93	2.60	3.26	21.55	10.11	32.98

TABLE 112: Hand-washing practices by locality and by state

Location	Number of Appropriate Handwashing Events Identified			Identified 5 Key Handwashing Times %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Matama	2.98	2.74	3.22	32.30	23.19	40.05
Shendi	2.54	2.26	2.78	14.22	7.10	23.84
Abu Hamad	1.97	1.62	2.39	3.32	0.22	7.24
Barbar	2.35	2.07	2.63	1.80	0.00	4.18
El Damar	2.35	2.18	2.51	6.13	3.74	9.04
Atbara	2.79	2.46	3.05	10.65	5.48	16.58
El Buhaira	2.43	2.26	2.58	3.10	1.45	4.82
River Nile State	2.48	2.21	2.76	11.10	5.60	16.59
Khartoum	2.31	2.06	2.54	5.41	2.53	9.14
Bahri	2.60	2.38	2.80	7.43	3.49	12.87
Um Durman	2.92	2.67	3.21	14.75	8.49	22.54
Um Bada	3.06	2.74	3.41	15.78	6.87	27.55
Jebel Awlia	2.04	1.81	2.33	1.61	0.00	4.56
Sharg Elneel	2.63	2.48	2.78	5.18	2.01	8.46
Karrari	3.14	2.83	3.41	25.05	15.46	32.78
Khartoum State	2.66	2.39	2.93	10.32	3.93	16.71
Greater Medani	2.56	2.32	2.81	9.08	3.42	17.35
Ganub Elgazira	2.40	2.21	2.56	3.46	1.13	7.40
El Hassahisa	2.01	1.81	2.19	1.36	0.00	3.18
El Kamlin	1.57	1.41	1.75	0.00	0.00	0.62
Sharg El Gezira	2.55	2.36	2.74	4.78	1.25	8.75
Um Elqura	2.54	2.29	2.84	1.63	0.60	3.44
El Manaqil	1.96	1.70	2.24	1.17	0.19	2.91
El Qurashi	2.46	2.22	2.67	3.92	1.31	7.01
Al-Gazeera State	2.21	1.99	2.44	3.08	0.01	6.43
Sennar	2.31	2.04	2.61	12.18	4.71	19.40
Sharg Sennar	2.18	1.93	2.48	8.07	1.76	17.49
Sinja	2.23	2.08	2.40	6.01	2.04	11.56
Abu Hujar	2.21	1.92	2.52	4.79	1.64	9.40
El Dali	1.73	1.50	1.98	2.43	0.19	5.83
Es Suki	1.84	1.62	2.10	4.65	1.78	8.47
Ed Dinder	1.96	1.80	2.11	0.45	0.00	1.57
Sennar State	2.11	1.86	2.36	6.30	0.89	11.72
Ed Damazine	3.12	2.77	3.44	24.32	14.19	34.97
El Tadamon	3.23	3.13	3.33	1.50	0.25	3.21
El Roseiris	2.48	2.23	2.73	8.44	4.02	13.29

TABLE 112: Hand-washing practices by locality and by state

Location	Number of Appropriate Handwashing Events Identified			Identified 5 Key Handwashing Times %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Baw	3.34	2.90	3.70	30.15	19.70	39.60
Geisan	2.40	2.18	2.57	5.08	1.34	11.17
El Kurmuk	2.94	2.76	3.09	0.70	0.00	2.84
Wad El Mahi	1.92	1.63	2.16	0.20	0.00	1.20
Blue Nile State	2.78	2.51	3.04	11.99	5.10	18.88
Kosti	1.56	1.45	1.72	0.46	0.00	1.52
Guli	1.74	1.59	1.91	1.89	0.38	3.96
Tendalti	1.24	1.08	1.44	0.00	0.00	0.84
Es Salam	1.47	1.31	1.69	0.00	0.00	0.79
Rabak	2.82	2.49	3.13	11.96	6.81	16.49
El Jabalain	2.24	2.12	2.36	0.00	0.00	0.00
El Diwaim	1.88	1.70	2.08	0.77	0.00	1.79
Um Rimta	2.79	2.64	2.89	0.21	0.00	1.01
El Gitaina	2.88	2.62	3.13	8.89	3.71	15.77
White Nile State	2.08	1.86	2.29	3.07	0.01	6.16
Port Sudan	3.28	2.94	3.70	15.77	7.01	29.47
Swakin	1.92	1.57	2.29	10.95	5.16	16.57
El Gonob Welawlaib	2.69	2.23	3.09	2.00	0.44	4.08
Sinkat	1.27	1.15	1.39	0.20	0.00	1.03
Haya	2.02	1.73	2.27	0.00	0.00	0.00
Dordieb	1.67	1.33	1.99	1.28	0.00	4.16
Tokar	2.38	2.18	2.56	1.60	0.20	3.65
Agig	2.89	2.63	3.14	6.02	1.31	11.81
Gabaot Elma-aadin	2.69	2.53	2.88	1.85	0.00	5.72
Halaeeb (accessible parts)	2.49	2.17	2.75	1.92	0.00	5.97
Red Sea State	2.36	2.06	2.67	4.75	0.01	9.87
Kassala Town	3.39	3.16	3.64	26.32	19.08	34.06
Refi Kassla	2.85	2.60	3.06	9.63	5.35	14.15
Rural Western Kassala	2.55	2.43	2.68	0.57	0.00	1.59
New Halfa	2.33	2.16	2.51	4.23	1.06	8.16
Refi Nahr Atbara	2.13	2.03	2.21	0.42	0.00	1.48
Rural Khashm Elgirba	3.53	3.39	3.66	4.38	0.63	9.50
Rural Wad Elhilaiw	2.99	2.63	3.27	6.89	3.86	11.13
Rural Aroma	2.38	2.22	2.54	2.38	0.64	4.82
Refi North Delta	2.73	2.59	2.87	6.05	2.37	10.32
Refi Hamashkureib	3.41	3.16	3.77	20.59	11.28	32.86

TABLE 112: Hand-washing practices by locality and by state

Location	Number of Appropriate Handwashing Events Identified			Identified 5 Key Handwashing Times %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Telkok	2.23	2.00	2.50	2.81	0.76	5.88
Kassala State	2.80	2.58	3.03	10.06	4.37	15.75
Gedaref Town	3.29	2.88	3.65	25.25	15.85	35.56
Middle Geddaref	2.54	2.28	2.86	5.35	1.91	11.36
Elbutana	1.76	1.62	1.93	0.00	0.00	0.00
El Fashaga	2.02	1.83	2.20	3.31	0.78	7.14
El Rahad	2.52	2.20	2.76	3.04	0.79	6.31
Gala-a El Nahal	2.21	1.98	2.45	0.23	0.00	1.41
El Fao	2.23	2.12	2.33	0.36	0.00	1.46
El Qureisha	2.40	2.26	2.55	2.16	0.58	4.65
El Mafaza	2.21	2.08	2.35	0.00	0.00	0.73
Basunda	2.16	1.90	2.42	1.97	0.22	4.79
Western Galabat	1.82	1.63	2.00	2.27	0.20	5.34
Eastern Galabat	2.35	2.04	2.71	2.66	0.50	7.88
Al-Gadarif State	2.42	2.15	2.69	5.88	1.51	10.24
Sheikan	2.66	2.39	2.94	14.48	8.53	23.27
Um Rawaba	2.74	2.40	3.15	18.31	9.72	27.84
Um Dam Haj Ahmed	2.63	2.36	3.02	10.28	2.80	21.22
El Rahad	2.58	2.32	2.96	6.98	0.25	16.89
Bara	2.45	2.13	2.70	12.97	4.98	22.57
Gharb Bara	2.57	2.18	2.96	10.51	3.87	19.25
Soudari	2.06	1.81	2.40	6.09	0.62	13.72
Gebrat El Sheikh	2.63	2.37	2.89	15.58	8.45	23.45
North Kordofan State	2.56	2.24	2.87	12.92	4.65	21.20
Kadugli	2.58	2.34	2.79	9.20	3.68	15.79
Reif Shargi	2.02	1.90	2.18	0.00	0.00	5.60
Dilling	2.03	1.50	2.63	3.85	0.35	8.27
El Quoz	1.96	1.64	2.26	2.32	0.00	8.14
Habila	2.38	2.11	2.63	3.70	0.00	10.94
Abassiya	1.89	1.62	2.22	0.40	0.00	1.77
El Rashad	2.05	1.59	2.49	6.11	0.00	14.99
Abu Jubaiha	1.91	1.59	2.21	0.19	0.00	6.33
El Tadamon	1.92	1.52	2.40	1.90	0.00	6.74
Talodi	2.68	2.40	2.90	1.40	0.00	5.68
Ghadeer	2.12	1.87	2.60	0.00	0.00	5.99
El Leri	1.93	1.84	2.03	0.00	0.00	0.42

TABLE 112: Hand-washing practices by locality and by state

Location	Number of Appropriate Handwashing Events Identified			Identified 5 Key Handwashing Times %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Karshola	2.30	2.13	2.49	4.26	0.00	14.35
Delami	2.65	2.22	3.04	9.84	0.39	22.99
South Kordofan State	2.10	1.74	2.45	2.68	0.01	7.29
Abu Zabad	2.15	1.84	2.43	0.39	0.00	1.40
ElKhiwai	1.78	1.62	1.93	0.42	0.00	1.66
Ghubaish	2.08	1.84	2.35	0.85	0.00	2.14
El Nuhud	1.83	1.62	2.13	3.33	0.51	7.70
El Idia	2.43	2.09	2.73	9.11	4.88	15.34
Wad Benda	1.64	1.44	1.84	2.97	1.06	6.18
Lagawa	1.41	1.15	1.71	2.03	0.27	4.14
Elsunut	2.43	2.11	2.70	0.47	0.00	1.61
Keilik	2.76	2.52	2.92	10.84	7.23	15.27
Es Salam	2.33	2.13	2.51	4.72	2.31	7.45
Babanusa	1.67	1.43	1.90	0.00	0.00	0.00
Abyei	2.04	1.50	2.56	13.45	5.45	22.54
El Dibab	2.70	2.41	3.06	16.04	4.14	29.75
El Meiram	2.72	2.29	3.41	37.00	25.65	53.72
West Kordofan State	2.07	1.77	2.38	5.72	0.52	10.93
El Fasher	2.72	2.57	2.87	9.30	5.55	13.63
Tawila	2.21	2.00	2.44	6.74	3.10	11.09
Melit	2.11	1.93	2.29	2.05	0.19	5.07
Um Kadada	2.52	2.36	2.70	4.20	2.47	6.20
Kebkabiya	3.48	3.35	3.61	35.86	26.33	44.11
Kutum	3.05	2.83	3.28	7.13	4.05	10.65
El Mahalha	1.64	1.46	1.81	0.00	0.00	0.00
Saraf Omra	2.40	1.88	2.88	14.88	7.02	24.17
El Serief	1.33	1.26	1.39	0.00	0.00	0.00
Dar Elsalam	1.76	1.60	1.95	0.00	0.00	0.94
Kelemando	2.06	1.85	2.24	0.56	0.00	1.65
El Tawisha	2.73	2.59	2.87	22.22	18.21	26.77
Um Baru	2.27	2.10	2.44	0.75	0.00	3.65
El Lait	1.96	1.83	2.07	0.68	0.00	2.00
ELkuma	2.73	2.43	2.89	0.00	0.00	0.00
El Tina	1.78	1.11	2.33	0.00	0.00	0.00
Kernoi	2.77	2.56	2.97	18.52	10.96	25.34
North Darfur State	2.41	2.16	2.65	8.41	3.78	13.04

TABLE 112: Hand-washing practices by locality and by state

Location	Number of Appropriate Handwashing Events Identified			Identified 5 Key Handwashing Times %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Nyala South	3.21	3.09	3.31	2.63	0.75	5.15
Nyala North	3.21	2.88	3.65	2.33	0.00	6.45
Es Salam	2.27	2.13	2.46	0.00	0.00	2.71
El Wihda	2.45	2.25	2.63	11.11	6.42	16.83
Mershing	3.23	2.78	3.61	23.04	11.15	33.47
Beliel	3.13	3.02	3.27	19.64	15.08	25.30
Nitega	3.39	3.21	3.59	21.59	12.59	31.58
Sharg El Jabal (accessible parts)	1.93	1.60	2.27	0.00	0.00	0.00
Kas	1.84	1.72	1.96	0.00	0.00	0.35
Shattaya	1.79	1.65	1.92	0.00	0.00	0.00
Buram	1.68	1.52	1.82	0.00	0.00	0.00
Gereida	2.76	2.48	3.04	6.73	1.02	14.69
El Sunta	3.20	2.95	3.37	33.71	27.82	40.23
El Radoum	2.13	1.91	2.32	18.00	12.90	23.17
Tulus	2.53	2.23	2.78	1.99	0.00	7.05
Damso	2.60	1.95	3.15	11.19	4.88	18.09
Ed Elfursan	2.11	1.91	2.31	0.92	0.00	2.75
Kubum	2.12	1.97	2.24	0.12	0.00	0.74
Kateila	2.12	1.90	2.32	0.21	0.00	1.22
Rehaid Elbirdi	1.97	1.87	2.10	0.00	0.00	0.53
Um Dafoug	1.90	1.80	2.04	0.00	0.00	0.00
South Darfur State	2.49	2.25	2.74	5.77	1.67	9.88
Abu Jabra	1.96	1.78	2.13	0.22	0.00	1.50
Abu Karinka	2.21	2.05	2.38	5.05	2.05	8.13
Bahr El Arab	1.40	1.27	1.55	0.00	0.00	0.00
Adila	1.76	1.64	1.90	0.00	0.00	0.00
Ed Dain	2.54	2.29	2.78	3.18	0.73	6.85
Assalaya	1.78	1.70	1.90	0.00	0.00	0.50
El Firdous	2.10	1.90	2.36	2.28	0.67	4.94
Shia-ria	2.52	2.18	2.79	0.00	0.00	0.00
Yassin	1.95	1.82	2.06	0.54	0.00	1.52
East Darfur State	1.97	1.79	2.16	1.43	0.01	3.27
El Geneina	3.03	2.84	3.20	9.14	5.00	14.92
Habila	2.04	1.78	2.32	0.00	0.00	0.00
Kulbus	2.30	1.98	2.56	7.25	0.44	16.11

TABLE 112: Hand-washing practices by locality and by state

Location	Number of Appropriate Handwashing Events Identified			Identified 5 Key Handwashing Times %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Beida	3.29	3.18	3.38	3.95	1.51	7.06
Foro Baranga	2.57	2.36	2.75	1.07	0.00	3.00
Kereneik	2.34	2.19	2.49	3.93	2.22	6.21
Sirba	2.56	2.20	2.85	3.09	1.10	6.06
Jebel Moon	2.64	2.30	2.93	6.89	2.52	12.59
West Darfur State	2.67	2.44	2.90	5.64	0.88	10.41
Zalingi	1.48	1.25	1.70	1.65	0.00	4.92
Wadi Salih	2.32	2.21	2.42	0.00	0.00	0.00
Mukjar	2.04	1.83	2.28	0.00	0.00	0.44
Central Jebel Mara	1.89	1.76	2.04	0.68	0.00	3.55
North Jebel Mara	1.69	1.51	1.94	0.00	0.00	2.08
Bendasi	1.97	1.77	2.14	1.99	0.34	4.62
Nertiti	2.03	1.88	2.19	0.38	0.00	1.32
Azum	4.30	3.97	4.46	59.64	49.61	67.60
Um Dukhun	2.21	1.95	2.48	0.39	0.00	1.69
Central Darfur State	2.14	1.93	2.35	5.39	2.69	8.08

Spatial distribution of identification of key hand-washing events

Low proportion of carers able to identify all five, key hand-washing events was evenly spread throughout the country *(see Figure 360)*.

FIGURE 360:
Carer: WASH: Number of appropriate hand-washing events identified (raster)

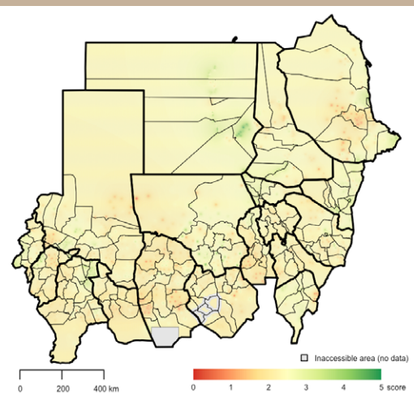


FIGURE 361:
Carer: WASH: Number of appropriate hand-washing events identified

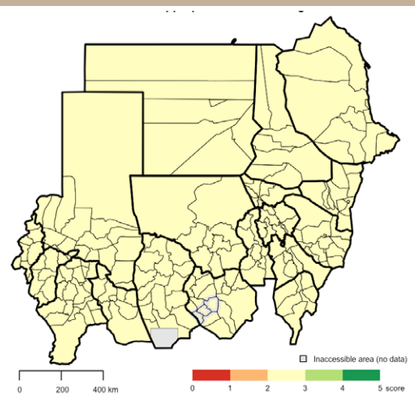


FIGURE 362:
Carer: WASH: Identified five, key hand-washing times (raster)

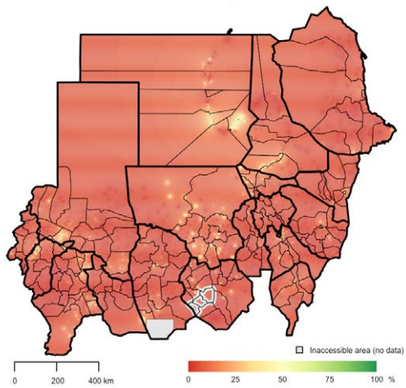
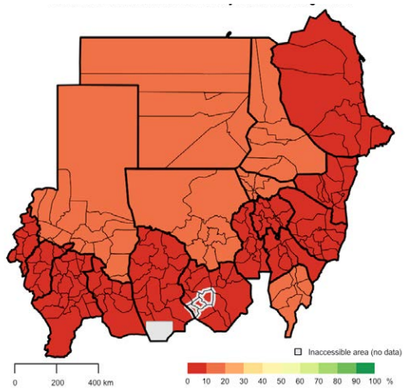


FIGURE 363:
Carer: WASH: Identified five, key hand-washing times



3.20.5 Hand-washing events

Hand-washing events average results

Hand-washing before eating was the most commonly identified hand-washing event by carers, with 79.2 per cent (95 per cent CI: 71.7-86.8) who identified it. All other hand-washing events were identified by no more than 50 per cent of carers *(see Figure 364)*. Hand-washing before eating was also the most commonly identified hand-washing event by carers in all states *(see Figure 365)*.

Table 113 and Table 114 present results by locality, by state and at the national level for the average number of hand-washing events identified and the proportion of carers able to identify each of the five, key hand-washing events.

FIGURE 364: Hand-washing events – national

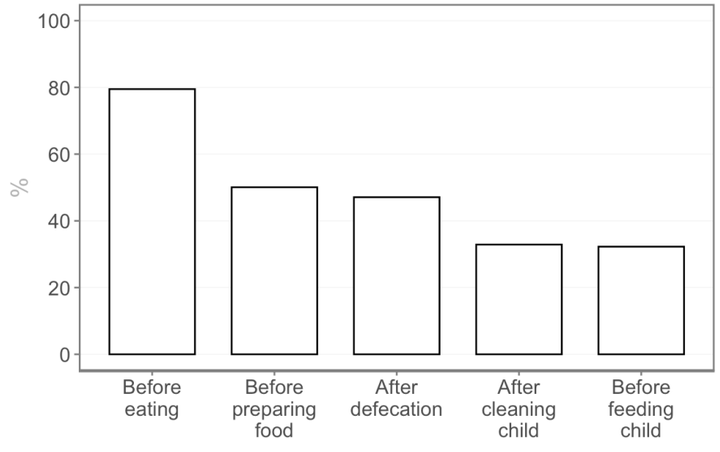


FIGURE 365: Hand-washing events by state

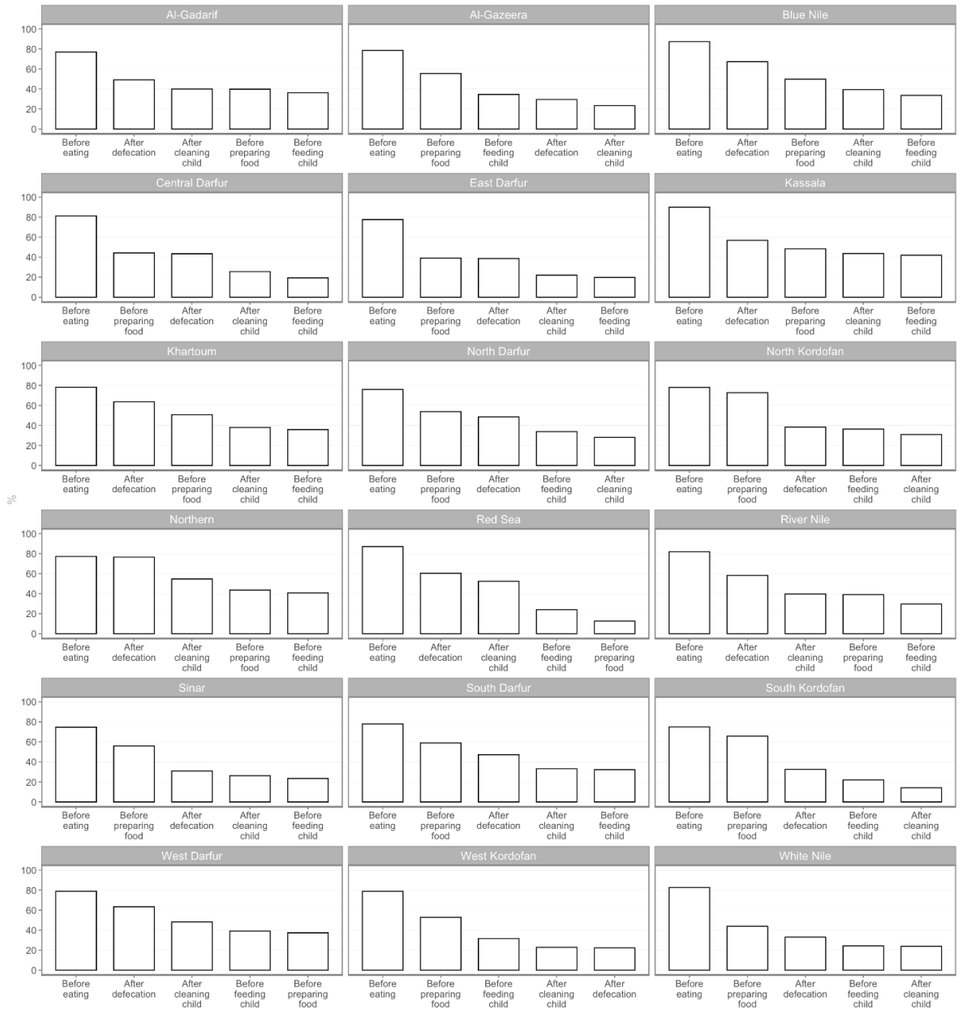


TABLE 113: Hand-washing events by state and national

State	After Defecation %			After Cleaning Child %			Before Eating %			Before Feeding Child %			Before Preparing Food %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	49.04	37.86	60.22	39.89	29.3	50.49	76.95	69.94	83.97	36.12	25.35	46.88	39.75	30.86	48.63
Al-Gazeera	29.48	21.3	37.67	23.43	16.15	30.71	78.49	69.15	87.83	34.49	26.62	42.36	55.44	45.79	65.09
Blue Nile	67.2	57.9	76.5	39.35	29.7	49.01	87.22	81.32	93.13	33.57	22.89	44.25	49.74	39.72	59.76
Central Darfur	43.45	32.61	54.28	25.59	18.4	32.79	81.33	73.7	88.95	19.29	12.4	26.18	44.24	35.66	52.82
East Darfur	38.66	29.61	47.7	22.07	14.51	29.64	77.66	69.96	85.36	19.81	13.41	26.22	39.07	30.93	47.21
Kassala	56.81	47.86	65.76	43.59	35.2	51.98	89.98	84.89	95.08	41.97	33.26	50.68	48.37	40.21	56.53
Khartoum	63.54	53.26	73.82	38.02	27.57	48.48	78.23	71.78	84.68	35.81	26.58	45.05	50.81	40.61	61.01
North Darfur	48.54	37.88	59.19	28.08	19.44	36.72	75.96	67.2	84.73	33.83	25.81	41.84	53.76	43.97	63.56
North Kordofan	38.32	28.88	47.76	30.91	20.79	41.04	78	71.46	84.54	36.37	25.78	46.96	72.72	64.07	81.37
Northern	76.55	68.04	85.06	54.75	43.26	66.24	77.21	69.71	84.72	40.69	29.09	52.3	43.55	32.31	54.79
Red Sea	60.29	50.82	69.76	52.37	41.51	63.24	87.01	79.36	94.66	24.01	15.34	32.68	12.6	6.35	18.84
River Nile	58.31	48.03	68.59	39.67	29.71	49.64	82.02	75.2	88.84	29.66	21.31	38.02	39.05	30.66	47.44
Sennar	30.94	22.83	39.05	26.15	17.5	34.81	74.69	68.73	80.65	23.46	16.34	30.57	55.89	46.97	64.81
South Darfur	47.2	37.3	57.1	33.21	25.64	40.77	77.93	69.6	86.25	32.2	22.81	41.58	58.95	49.77	68.13
South Kordofan	32.53	20.57	44.48	14.15	3.95	24.34	75	65.37	84.63	21.98	10.97	32.99	65.73	52.57	78.88
West Darfur	63.33	52.53	74.13	48.16	37.78	58.54	78.89	71.89	85.89	39.04	30.85	47.22	37.29	27.07	47.51
West Kordofan	22.23	13.29	31.17	22.83	14.04	31.61	78.85	69.85	87.84	31.57	21.61	41.53	52.76	40.9	64.61
White Nile	32.98	23.94	42.02	23.86	16.7	31.02	82.69	76.11	89.28	24.31	16.47	32.16	43.9	35.09	52.7
Sudan	47.09	37.4	56.78	32.89	23.75	42.04	79.48	71.92	87.04	32.26	23.27	41.25	50.07	40.55	59.59

TABLE 114: Improved drinking water sources by locality and by state

Location	After Defecation %			After Cleaning Child %			Before Eating %			Before Feeding Child %			Before Preparing Food %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	58.42	48.68	69.73	46.51	37.67	55.80	76.44	67.29	82.80	37.56	29.20	50.00	37.52	27.55	48.51
El Golid	88.33	79.56	95.38	61.32	52.52	70.00	74.69	67.98	80.93	35.88	25.46	48.17	33.54	16.27	50.31
Merwoe	96.42	92.77	99.25	84.62	66.41	98.60	93.01	88.80	96.57	77.41	58.73	92.79	68.96	57.71	81.12
El Daba	81.82	70.13	91.30	50.70	37.98	60.80	70.85	62.80	77.08	17.61	10.22	24.84	29.30	19.57	41.83
Halfa	48.58	36.94	59.84	43.20	37.81	49.02	93.63	89.41	97.08	46.92	41.40	52.19	59.01	51.02	67.85
Delgo	58.85	53.55	63.81	35.69	25.99	45.72	98.18	95.65	100.00	38.06	27.01	49.36	52.88	46.44	60.32
El Burgaig	72.48	64.82	79.38	30.92	24.05	38.81	48.06	36.38	62.09	22.34	16.76	28.75	28.78	20.46	39.28
Northern State	76.55	68.04	85.06	54.75	43.26	66.24	77.21	69.71	84.72	40.69	29.09	52.3	43.55	32.31	54.79

TABLE 114: Improved drinking water sources by locality and by state

Location	After Defecation %			After Cleaning Child %			Before Eating %			Before Feeding Child %			Before Preparing Food %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Matama	62.26	54.93	68.97	52.21	45.04	59.44	77.47	70.77	84.05	44.78	38.40	52.54	61.30	53.20	68.95
Shendi	46.48	34.70	54.14	41.52	29.97	51.70	85.39	81.02	89.01	27.27	18.72	35.94	52.83	46.61	59.13
Abu Hamad	39.83	25.06	55.71	28.37	19.06	37.64	89.29	83.55	94.31	19.40	12.03	30.22	19.24	10.57	27.82
Barbar	65.84	55.87	75.14	30.00	21.57	39.35	67.87	51.59	81.46	39.13	29.89	46.34	31.65	19.48	42.81
El Damar	60.53	50.86	68.29	30.90	23.96	38.21	85.30	80.95	89.02	23.09	17.07	29.65	35.42	27.81	42.70
Atbara	85.61	73.89	94.28	59.88	45.30	73.39	80.05	72.57	86.55	32.10	21.07	42.78	20.77	14.21	27.71
El Buhaira	44.28	38.18	50.22	44.91	33.25	59.38	93.33	91.17	95.20	21.91	13.90	30.27	39.45	25.52	54.98
River Nile State	58.31	48.03	68.59	39.67	29.71	49.64	82.02	75.2	88.84	29.66	21.31	38.02	39.05	30.66	47.44
Khartoum	43.58	31.21	56.19	26.79	18.58	36.11	72.05	63.05	80.18	32.11	23.15	39.49	56.11	47.26	62.99
Bahri	76.38	65.50	83.04	33.63	19.91	48.24	71.08	65.54	78.14	35.82	27.97	43.87	42.21	32.22	54.69
Um Durman	62.40	51.44	73.94	51.96	42.70	63.32	81.48	74.84	87.37	40.00	30.95	47.88	56.62	49.84	62.16
Um Bada	91.30	84.22	96.37	55.00	42.97	66.54	79.89	74.03	85.10	43.81	34.84	54.19	36.86	26.72	48.21
Jebel Awlia	42.03	29.67	55.77	21.10	13.14	31.05	68.80	60.90	74.67	26.73	15.93	39.68	48.61	36.66	60.86
Sharg Elneel	55.03	43.90	66.16	29.46	21.66	37.29	87.52	80.75	92.72	30.71	24.44	36.63	61.23	49.25	72.30
Karrari	71.99	62.65	79.51	50.09	39.95	59.33	85.33	80.60	89.91	45.59	36.72	53.70	61.17	49.52	70.38
Khartoum State	63.54	53.26	73.82	38.02	27.57	48.48	78.23	71.78	84.68	35.81	26.58	45.05	50.81	40.61	61.01
Greater Medani	45.47	36.93	54.76	30.03	22.35	38.73	79.97	73.39	86.10	36.18	28.72	43.55	64.48	57.26	71.58
Ganub Elgazira	37.39	28.80	47.84	25.76	20.44	33.42	78.61	70.39	85.87	39.79	32.92	46.00	58.11	46.92	67.36
El Hassahisa	19.12	12.78	26.19	19.34	13.46	26.05	78.03	72.35	84.07	34.96	28.45	41.40	49.61	41.71	58.11
El Kamlin	15.34	9.90	21.76	16.04	11.31	21.72	60.82	54.92	68.07	17.08	10.39	24.90	46.00	38.70	54.10
Sharg El Gezira	51.74	41.74	60.17	33.91	26.44	42.61	82.32	73.54	90.47	31.86	24.77	39.82	55.28	47.94	63.73
Um Elqura	36.20	27.36	44.25	39.56	29.99	49.82	87.97	82.89	91.90	42.20	33.12	51.22	48.89	40.63	56.70
El Manaqil	17.75	11.71	25.69	14.00	8.74	20.41	74.63	58.73	88.12	32.94	24.77	41.21	57.20	45.68	67.52
El Qurashi	26.65	20.00	34.59	26.39	20.41	33.48	90.22	83.95	95.89	41.49	31.78	50.24	60.04	48.14	69.61
Al-Gazeera State	29.48	21.3	37.67	23.43	16.15	30.71	78.49	69.15	87.83	34.49	26.62	42.36	55.44	45.79	65.09
Sennar	48.02	38.98	58.86	39.08	31.34	47.14	66.71	61.37	72.86	23.86	16.78	30.47	53.21	46.17	58.48
Sharg Sennar	31.15	23.73	39.09	34.26	23.76	45.14	80.94	75.35	86.51	34.98	26.33	44.67	37.48	28.20	46.74
Sinja	45.63	40.80	51.90	23.61	16.56	31.31	71.20	66.32	76.02	22.02	16.77	27.97	60.20	52.37	66.91
Abu Hujar	27.87	16.85	38.39	26.34	14.23	38.24	79.96	72.17	86.71	28.77	20.67	38.19	57.69	44.47	71.47
El Dali	16.09	8.76	26.12	11.39	3.91	21.19	76.18	68.19	83.98	6.54	3.00	11.61	60.26	51.30	68.50
Es Suki	23.46	15.83	31.43	17.39	12.55	23.34	65.92	58.71	72.25	20.68	14.60	26.65	57.65	50.59	66.40
Ed Dinder	6.86	3.69	11.16	14.32	6.90	21.61	86.50	81.01	92.36	15.70	11.06	21.81	71.46	61.38	82.02
Sennar State	30.94	22.83	39.05	26.15	17.5	34.81	74.69	68.73	80.65	23.46	16.34	30.57	55.89	46.97	64.81
Ed Damazine	73.32	61.13	85.01	41.59	32.19	51.99	90.33	87.79	93.07	41.68	32.23	52.42	65.84	59.02	72.89
El Tadamon	98.52	97.01	99.75	42.05	34.56	48.40	95.05	88.34	98.79	35.40	26.98	42.12	52.70	46.89	60.16

TABLE 114: Improved drinking water sources by locality and by state

Location	After Defecation %			After Cleaning Child %			Before Eating %			Before Feeding Child %			Before Preparing Food %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Roseiris	53.63	42.97	64.83	40.85	29.15	51.86	78.54	72.07	83.17	33.78	25.82	43.55	40.90	35.43	47.36
Baw	84.96	73.73	93.82	71.18	61.25	79.15	91.34	87.50	94.39	54.63	40.80	66.09	30.88	19.99	41.77
Geisan	60.05	53.68	67.37	22.87	13.79	31.29	81.05	69.23	89.07	27.63	18.90	37.17	49.21	37.82	60.42
El Kurmuk	63.09	54.56	70.28	47.62	36.21	58.91	96.21	92.81	98.57	29.80	16.37	49.06	56.28	38.59	72.47
Wad El Mahi	49.51	40.06	56.95	3.91	1.26	9.19	86.25	74.99	94.77	2.15	0.59	4.36	50.49	39.73	61.54
Blue Nile State	67.2	57.9	76.5	39.35	29.7	49.01	87.22	81.32	93.13	33.57	22.89	44.25	49.74	39.72	59.76
Kosti	10.99	6.32	16.67	6.12	3.65	9.69	70.03	62.01	78.52	24.70	16.61	33.18	45.05	38.50	52.96
Guli	20.45	13.48	29.95	14.18	10.03	18.84	89.68	82.75	94.82	18.05	12.52	24.90	29.85	19.81	43.29
Tendalti	21.89	15.55	29.28	8.63	5.00	12.58	64.26	56.69	71.93	19.71	11.89	29.35	10.08	3.45	21.98
Es Salam	4.22	0.95	13.42	7.62	3.21	14.07	95.43	92.13	97.91	4.24	0.40	12.18	35.53	24.80	47.35
Rabak	55.80	44.79	64.86	46.68	34.69	57.64	84.68	79.14	90.41	48.04	39.25	57.28	47.22	37.44	56.30
El Jabalain	26.48	19.42	33.97	6.36	3.62	11.05	84.06	79.58	88.76	19.58	11.66	29.06	87.23	82.09	92.05
El Diwaim	27.54	20.10	38.13	7.92	3.54	13.30	95.20	91.37	97.88	11.76	6.23	20.81	45.31	37.96	53.32
Um Rimta	80.94	68.23	89.54	82.85	69.96	90.00	72.33	62.81	82.73	17.06	10.29	25.00	26.83	16.31	35.85
El Gitaina	59.30	47.72	71.73	56.08	46.52	66.81	91.46	86.69	95.55	36.99	28.76	43.95	44.83	37.73	51.53
White Nile State	32.98	23.94	42.02	23.86	16.7	31.02	82.69	76.11	89.28	24.31	16.47	32.16	43.9	35.09	52.7
Port Sudan	89.13	83.33	93.98	83.96	74.63	91.14	80.22	72.18	88.16	49.73	37.75	60.06	26.22	17.65	36.20
Swakin	21.37	10.66	31.95	21.85	12.11	32.42	95.73	93.12	97.72	32.37	23.67	42.04	18.91	10.08	28.66
El Gonob Welawlaib	78.64	63.04	89.97	63.05	42.94	83.22	98.15	96.45	99.49	26.54	18.79	35.33	3.16	1.11	5.76
Sinkat	9.76	4.01	17.63	4.77	1.63	8.53	97.24	94.47	99.36	8.92	3.57	16.13	5.63	1.81	9.35
Haya	64.59	50.60	75.99	57.65	48.69	66.35	74.61	62.41	84.89	3.75	1.26	6.57	1.09	0.00	3.07
Dordieb	20.96	10.61	33.70	19.83	8.68	32.19	95.56	92.06	98.20	20.26	9.91	30.62	9.11	4.01	15.12
Tokar	36.29	26.52	45.31	29.23	20.96	37.93	93.51	89.61	97.52	43.35	34.23	52.27	35.36	25.69	45.31
Agig	99.13	97.62	100.00	71.98	57.35	86.78	86.49	77.59	93.49	23.16	13.69	33.62	7.07	2.59	12.91
Gabaot Elma-aadin	68.37	58.27	76.59	68.61	62.65	75.79	81.20	72.03	89.19	41.57	32.65	51.70	9.16	5.15	14.00
Halaeeb (accessible parts)	76.79	63.85	86.37	61.90	43.05	75.84	96.77	87.29	100.00	10.99	4.76	18.47	1.89	0.00	5.72
Red Sea State	60.29	50.82	69.76	52.37	41.51	63.24	87.01	79.36	94.66	24.01	15.34	32.68	12.6	6.35	18.84
Kassala Town	77.26	70.34	83.33	58.97	50.81	67.91	93.91	90.36	96.59	61.11	52.73	69.39	47.55	40.19	56.06
Refi Kassla	75.00	67.31	82.48	33.38	23.75	44.69	83.98	78.09	89.22	38.11	28.52	48.30	53.03	45.57	60.70
Rural Western Kassala	29.98	22.76	38.76	33.45	24.57	44.31	85.04	76.66	93.06	25.04	17.37	32.28	80.45	70.62	90.21
New Halfa	58.87	50.31	67.18	28.48	22.05	35.60	85.08	79.35	90.07	24.04	18.03	30.14	36.91	29.45	44.23
Refi Nahr Atbara	17.44	10.29	25.43	9.87	5.67	15.12	87.61	80.24	93.93	15.13	8.60	23.54	83.19	75.41	89.92

TABLE 114: Improved drinking water sources by locality and by state

Location	After Defecation %			After Cleaning Child %			Before Eating %			Before Feeding Child %			Before Preparing Food %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Khashm Elgirba	97.27	92.80	99.79	91.63	88.07	95.01	90.59	85.80	93.99	68.42	57.87	77.85	5.44	1.46	11.00
Rural Wad Elhilaiw	63.91	53.24	74.54	67.75	53.30	79.69	87.91	82.08	92.12	55.68	42.47	66.40	24.01	18.45	30.16
Rural Aroma	15.47	8.61	24.63	27.27	17.11	37.16	89.27	83.23	94.09	47.38	39.56	55.50	58.25	51.47	65.06
Refi North Delta	39.41	34.40	44.95	54.76	47.67	61.50	89.10	81.14	95.32	37.17	28.44	46.90	52.82	42.68	62.43
Refi Hamashkureib	69.25	61.89	76.48	77.64	67.72	86.88	92.67	89.00	96.24	50.83	40.71	62.21	51.68	41.93	61.95
Rural Telkok	44.25	30.66	59.48	9.79	4.69	16.38	94.51	90.20	97.23	32.02	23.13	40.26	43.56	35.81	51.62
Kassala State	56.81	47.86	65.76	43.59	35.2	51.98	89.98	84.89	95.08	41.97	33.26	50.68	48.37	40.21	56.53
Gedaref Town	62.31	53.48	72.81	64.04	49.90	78.29	88.83	83.64	93.20	60.31	45.83	73.72	53.86	45.06	60.72
Middle Geddaref	67.56	53.88	77.40	42.09	30.06	53.08	81.22	70.58	90.01	28.44	21.24	38.48	33.41	23.65	44.71
Elbutana	20.82	11.34	30.16	14.93	9.65	20.73	82.02	71.70	90.45	18.04	11.17	26.25	40.22	28.07	54.45
El Fashaga	56.14	44.17	68.01	32.88	24.81	43.00	90.62	87.33	94.09	13.42	7.95	19.36	8.09	3.95	12.90
El Rahad	56.91	41.78	67.82	51.19	37.49	60.60	60.04	53.48	66.61	39.27	27.02	51.05	43.84	35.38	54.35
Gala-a El Nahal	36.26	19.35	54.61	28.27	17.42	38.05	84.40	78.03	90.27	21.35	11.89	34.05	50.23	39.00	64.39
El Fao	49.91	36.66	62.35	10.27	6.34	14.66	62.81	56.69	68.98	43.34	36.05	51.77	55.99	50.53	61.78
El Qureisha	53.46	48.28	59.24	53.24	46.50	59.20	93.50	90.32	97.10	19.42	14.26	25.72	20.74	15.11	25.59
El Mafaza	30.38	19.15	41.80	41.11	32.69	49.21	79.28	71.79	87.69	28.67	23.21	33.99	41.55	32.70	50.01
Basunda	41.16	33.54	48.58	37.00	25.18	47.53	68.26	62.04	74.89	36.86	24.49	49.47	33.72	26.31	43.89
Western Galabat	35.23	22.77	48.00	27.54	16.76	39.00	64.41	57.62	70.58	28.07	20.21	36.69	26.11	13.55	41.43
Eastern Galabat	45.83	38.10	53.12	39.11	26.04	53.13	77.15	69.39	84.28	39.89	24.27	57.90	34.82	25.12	43.80
Al-Gadarif State	49.04	37.86	60.22	39.89	29.3	50.49	76.95	69.94	83.97	36.12	25.35	46.88	39.75	30.86	48.63
Sheikan	38.86	31.43	47.20	32.56	24.66	40.61	74.06	68.46	79.97	41.05	32.91	50.23	78.80	72.87	84.77
Um Rawaba	37.90	29.63	46.37	35.22	24.40	44.46	85.54	79.03	90.47	44.67	33.20	57.24	71.39	63.69	79.47
Um Dam Haj Ahmed	36.33	26.72	47.05	33.06	20.89	44.02	77.30	65.16	86.56	40.33	29.20	51.75	78.80	66.08	89.75
El Rahad	49.75	37.95	61.42	23.04	11.60	38.18	84.99	80.25	89.11	26.38	15.82	41.88	76.09	68.76	83.67
Bara	38.36	28.11	48.60	28.22	16.99	38.82	78.10	71.26	85.20	27.05	19.30	36.22	73.67	65.36	80.80
Gharb Bara	45.01	30.25	59.32	31.27	19.95	42.35	74.42	67.35	80.60	34.13	22.36	46.92	74.34	64.69	82.55
Soudari	34.76	26.08	43.18	24.23	16.84	32.90	72.34	63.86	79.36	24.18	16.13	35.30	51.56	41.07	63.35
Gebrat El Sheikh	28.60	19.83	39.67	36.69	27.27	45.07	81.55	74.21	88.70	39.75	28.97	47.88	76.54	66.23	86.11
North Kordofan State	38.32	28.88	47.76	30.91	20.79	41.04	78	71.46	84.54	36.37	25.78	46.96	72.72	64.07	81.37
Kadugli	56.09	47.38	63.12	25.12	17.82	33.84	79.59	72.58	86.15	34.75	29.18	41.06	62.33	54.95	70.08
Reif Shargi	41.77	33.25	49.62	4.36	2.07	9.75	72.00	65.11	79.36	15.21	8.74	23.27	66.74	60.95	74.59
Dilling	36.33	19.36	54.31	17.21	8.06	29.26	69.41	56.32	83.13	21.95	10.57	34.12	61.85	40.44	80.10

TABLE 114: Improved drinking water sources by locality and by state

Location	After Defecation %			After Cleaning Child %			Before Eating %			Before Feeding Child %			Before Preparing Food %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Quoz	26.20	16.28	38.19	12.87	4.75	24.62	71.02	60.81	79.96	26.10	16.40	36.87	59.26	51.59	66.41
Habila	31.10	22.19	41.37	13.45	6.05	23.76	86.43	76.72	94.19	31.58	21.59	41.69	75.92	65.38	84.21
Abassiya	22.31	13.83	32.55	11.38	5.47	20.70	72.30	64.79	81.35	19.64	6.69	33.23	63.87	48.71	76.04
El Rashad	35.18	20.63	49.38	15.84	6.07	27.28	77.29	69.52	84.89	18.01	8.70	30.98	56.83	40.74	70.91
Abu Jubaiha	18.76	12.11	29.92	7.47	1.90	14.94	73.58	63.04	83.67	17.84	9.47	28.80	71.43	57.92	83.66
El Tadamon	15.19	4.31	30.99	16.18	6.47	26.89	75.86	65.82	86.98	24.67	14.15	35.73	62.14	47.34	78.18
Talodi	42.66	29.17	57.67	30.00	10.86	49.31	86.71	78.87	92.32	34.03	16.99	48.66	78.17	61.11	89.25
Ghadeer	33.44	17.94	52.82	11.11	1.27	29.03	85.23	77.27	91.33	16.89	2.87	39.41	64.53	46.00	78.05
El Leri	26.46	17.95	35.54	5.89	2.87	10.24	74.59	68.32	81.40	11.80	8.31	15.63	73.85	66.18	80.82
Abu Karshola	57.39	45.68	67.58	16.91	10.63	25.73	72.08	62.51	80.39	17.72	10.85	27.84	67.37	59.15	75.74
Delami	51.78	31.43	68.83	29.80	12.86	48.30	86.72	73.46	97.59	29.92	11.39	44.39	67.48	46.21	85.95
South Kordofan State	32.53	20.57	44.48	14.15	3.95	24.34	75	65.37	84.63	21.98	10.97	32.99	65.73	52.57	78.88
Abu Zabad	26.76	17.15	36.62	15.13	9.39	21.83	77.97	68.36	86.92	24.40	16.80	34.45	70.28	58.99	81.69
ElKhiwai	17.63	10.34	24.79	7.68	4.32	11.76	86.08	76.11	92.95	13.90	6.59	24.32	52.29	44.78	59.10
Ghubaish	23.13	13.93	32.34	23.33	13.51	34.76	81.05	70.23	89.71	31.09	20.12	42.46	48.18	36.02	60.00
El Nuhud	11.43	6.08	18.85	14.08	7.82	23.00	71.30	61.24	82.40	44.33	34.33	53.85	40.85	27.99	54.06
El Idia	28.63	19.47	39.52	38.65	29.72	47.41	92.38	85.32	96.23	43.02	31.09	54.32	40.42	32.39	50.20
Wad Benda	13.16	8.16	18.39	10.88	6.39	16.41	56.58	45.01	68.11	14.29	9.10	21.13	68.42	56.68	80.94
Lagawa	10.55	5.21	17.30	6.28	2.59	11.30	57.96	47.87	67.34	9.56	3.83	16.63	56.83	49.62	63.93
Elsunut	26.45	16.66	34.05	19.81	14.24	26.25	87.79	82.51	92.34	35.36	21.06	50.48	74.25	54.99	86.92
Keilik	56.90	45.80	65.82	43.73	36.74	50.01	82.29	76.26	86.50	24.76	18.80	30.64	69.06	62.46	74.95
Es Salam	45.25	35.15	53.48	47.37	39.29	54.60	81.80	77.78	86.10	29.71	24.12	35.85	29.05	18.48	41.02
Babanusa	4.85	2.83	7.10	19.21	12.05	26.67	81.76	74.60	88.39	22.32	13.41	31.22	37.75	29.92	44.91
Abyei	20.48	11.78	31.25	25.52	14.80	36.52	83.80	73.66	93.02	26.87	12.75	38.09	45.52	35.42	55.96
El Dibab	20.73	8.32	35.73	37.63	23.89	48.72	94.12	89.58	97.95	45.08	36.32	56.49	74.47	59.98	85.50
El Meiram	37.79	24.09	57.79	40.44	29.51	55.42	100.00	98.06	100.00	46.73	36.21	60.01	47.90	31.96	72.46
West Kordofan State	22.23	13.29	31.17	22.83	14.04	31.61	78.85	69.85	87.84	31.57	21.61	41.53	52.76	40.9	64.61
El Fasher	67.05	62.41	72.09	35.12	28.83	41.87	85.54	81.53	88.51	36.01	29.01	42.11	49.17	44.20	54.42
Tawila	26.00	17.65	35.74	19.11	11.89	26.66	90.91	86.75	94.59	39.96	34.43	45.66	45.04	37.09	53.84
Melit	36.79	27.65	47.44	14.71	8.89	22.45	75.96	67.13	84.74	15.46	8.99	24.54	67.57	60.21	74.84
Um Kadada	75.30	71.25	78.94	48.37	41.08	56.37	89.72	85.56	93.55	25.72	19.84	31.58	12.45	9.40	16.06
Kebkabiya	76.59	67.66	83.67	72.41	67.12	77.70	69.30	64.54	75.00	70.07	64.78	75.45	60.93	50.52	69.38
Kutum	61.69	55.76	68.28	26.45	16.97	36.16	92.88	87.69	96.83	52.12	35.96	68.13	72.53	61.07	81.30
El Mahalha	33.09	23.21	42.58	20.11	12.43	27.47	49.42	41.95	56.86	16.01	10.79	22.57	45.09	34.68	57.18

TABLE 114: Improved drinking water sources by locality and by state

Location	After Defecation %			After Cleaning Child %			Before Eating %			Before Feeding Child %			Before Preparing Food %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Saraf Omra	41.30	22.33	61.72	38.27	18.71	54.63	63.62	56.07	70.43	52.47	40.18	64.27	44.24	37.93	51.10
El Serief	2.23	0.74	4.16	1.31	0.37	3.00	50.38	40.11	62.02	21.20	15.77	27.20	57.56	45.68	70.52
Dar Elsalam	44.68	35.49	57.41	9.09	5.99	12.30	62.12	56.73	66.99	8.70	5.26	12.35	51.31	42.68	60.19
Kelemando	33.15	27.47	39.64	10.25	6.69	14.55	73.94	66.83	80.62	21.96	14.71	29.56	63.67	58.62	68.67
El Tawisha	31.22	24.55	36.93	37.32	32.23	42.11	89.90	85.74	93.59	42.60	37.85	47.23	72.67	66.23	77.46
Um Baru	53.81	46.38	63.44	4.48	1.33	9.06	97.80	88.61	100.00	9.91	4.38	15.34	61.32	51.05	68.80
El Lait	24.28	19.52	29.67	13.64	9.48	19.74	75.28	69.09	81.51	32.30	27.58	37.21	49.56	44.21	55.04
ELkuma	45.99	32.53	55.95	36.67	22.53	47.87	88.97	79.28	96.02	48.72	38.96	57.75	52.08	41.91	60.82
El Tina	33.33	0.00	66.67	11.11	0.00	33.33	66.67	33.33	100.00	0.00	0.00	0.00	66.67	43.89	100.00
Kernoi	55.65	47.86	62.65	26.75	20.17	33.84	93.18	89.83	96.38	47.82	37.81	56.16	53.83	48.34	58.52
North Darfur State	48.54	37.88	59.19	28.08	19.44	36.72	75.96	67.2	84.73	33.83	25.81	41.84	53.76	43.97	63.56
Nyala South	86.23	81.36	90.36	59.91	54.84	64.41	76.50	71.52	81.43	60.19	54.23	65.64	38.27	33.32	43.36
Nyala North	84.18	62.19	99.14	75.00	62.33	87.54	73.02	58.25	90.98	52.53	36.99	77.17	37.21	17.50	50.48
Es Salam	45.19	38.51	51.55	17.47	11.38	24.47	68.21	63.15	74.03	8.63	3.85	22.92	87.06	79.06	94.38
El Wihda	38.15	30.12	45.77	28.77	22.86	34.87	96.01	92.37	98.49	36.45	29.10	43.20	46.13	36.84	55.66
Mershing	62.34	44.99	76.39	45.71	30.95	57.93	97.44	94.73	99.14	46.98	39.69	52.98	70.20	56.69	82.44
Beliel	58.81	52.61	65.63	35.29	29.18	41.51	89.74	83.57	94.66	41.32	36.81	46.03	88.32	82.02	93.67
Nitega	93.69	89.82	96.65	53.27	46.95	59.95	78.34	68.39	87.60	31.06	23.35	38.58	83.75	78.15	89.28
Sharg El Jabal (accessible parts)	6.67	0.00	26.67	0.00	0.00	0.00	60.00	39.67	80.00	73.33	53.33	93.33	53.33	26.67	80.00
Kas	26.88	16.43	38.65	4.24	2.31	7.08	74.25	67.39	80.00	5.95	3.51	8.56	72.19	65.36	78.63
Shattaya	13.32	8.39	19.10	2.19	0.44	4.14	76.25	69.69	82.60	4.73	1.96	8.13	82.15	74.65	87.51
Buram	22.24	15.38	28.91	1.22	0.16	3.05	81.17	75.91	85.60	2.85	0.75	6.45	59.86	48.86	68.91
Gereida	72.49	62.32	81.21	24.56	17.30	35.05	87.73	83.46	91.67	24.46	16.73	32.87	65.56	57.16	74.01
El Sunta	88.35	82.02	93.18	55.37	47.43	61.76	62.50	53.36	70.15	37.68	31.06	43.18	76.42	69.32	82.40
El Radoum	31.32	25.45	37.32	31.67	25.74	37.78	56.18	49.98	61.40	45.94	40.68	49.81	48.36	42.30	53.72
Tulus	34.12	24.07	45.97	26.80	14.51	36.64	87.87	80.62	93.40	50.37	32.33	61.51	55.43	45.06	69.40
Damso	38.41	24.46	50.51	32.07	19.78	43.25	81.85	61.26	95.22	55.05	35.33	69.50	50.85	38.46	62.50
Ed Elfursan	21.26	14.18	29.69	22.53	15.22	29.17	97.50	95.43	99.16	19.68	12.63	28.41	50.33	40.09	58.00
Kubum	40.10	29.92	50.37	14.66	11.66	17.84	67.27	63.22	71.64	14.64	8.48	21.29	75.00	66.81	82.11
Kateila	14.63	8.95	20.72	29.19	18.97	38.40	99.36	97.84	100.00	20.94	12.54	30.44	47.74	41.94	53.07
Rehaid Elbirdi	26.66	17.96	34.72	32.87	25.04	39.31	60.42	52.74	69.25	14.80	10.22	19.62	63.37	54.44	69.89
Um Dafoug	14.60	7.12	24.70	32.92	25.91	40.93	78.38	67.41	88.23	7.34	3.73	11.50	56.58	49.73	63.26
South Darfur State	47.2	37.3	57.1	33.21	25.64	40.77	77.93	69.6	86.25	32.2	22.81	41.58	58.95	49.77	68.13

TABLE 114: Improved drinking water sources by locality and by state

Location	After Defecation %			After Cleaning Child %			Before Eating %			Before Feeding Child %			Before Preparing Food %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Jabra	25.49	15.73	38.02	10.65	5.58	18.73	84.16	76.91	89.25	15.73	9.22	23.93	59.07	50.54	67.74
Abu Karinka	40.45	34.97	46.87	26.55	20.30	32.40	88.39	81.48	92.75	20.09	14.93	25.97	46.61	40.34	51.76
Bahr El Arab	25.48	17.19	34.49	15.51	8.40	24.61	74.45	64.98	84.68	12.85	6.24	21.85	9.97	4.42	16.25
Adila	41.00	25.92	55.82	14.24	7.52	20.53	59.41	53.68	65.86	7.76	3.84	12.78	53.27	46.66	59.82
Ed Dain	44.84	35.97	54.21	27.92	19.08	35.58	79.64	73.30	85.89	28.73	22.42	34.90	75.09	63.51	84.30
Assalaya	22.63	15.73	29.79	18.09	14.03	22.32	84.14	77.02	90.42	28.15	22.56	34.65	25.60	19.63	32.49
El Firdous	45.31	36.59	53.07	28.54	20.30	37.30	89.89	81.78	95.50	15.73	9.02	23.65	32.20	21.55	42.97
Shia-ria	91.67	87.40	94.86	36.66	24.86	48.76	53.54	40.81	65.14	32.44	25.20	39.35	38.34	22.88	51.67
Yassin	37.00	29.76	43.58	31.20	25.04	37.60	76.77	71.55	82.77	22.20	17.68	27.71	26.71	19.18	34.81
East Darfur State	38.66	29.61	47.7	22.07	14.51	29.64	77.66	69.96	85.36	19.81	13.41	26.22	39.07	30.93	47.21
El Geneina	72.93	65.73	80.65	50.78	43.18	58.49	85.13	80.26	88.83	46.14	36.83	54.64	48.24	40.78	55.57
Habila	44.69	25.09	61.86	46.09	32.64	62.11	68.89	58.64	82.27	37.77	31.29	44.23	7.64	4.09	11.48
Kulbus	45.89	34.31	56.39	24.24	14.81	36.56	78.44	71.93	85.06	16.52	7.86	27.16	62.85	46.22	78.12
Beida	95.08	87.22	99.35	79.80	71.59	88.42	84.20	80.86	88.11	46.78	41.29	53.12	23.34	16.19	30.14
Foro Baranga	63.98	49.79	77.11	58.87	49.19	67.50	48.56	37.63	59.65	73.94	63.06	82.45	12.95	9.01	17.89
Kereneik	51.54	44.92	58.09	25.82	21.86	29.86	87.30	81.31	92.57	19.12	15.32	22.90	50.68	44.50	56.83
Sirba	65.71	53.31	79.45	57.86	43.81	71.29	81.78	74.17	87.95	26.88	18.89	35.08	22.35	13.09	31.26
Jebel Moon	58.52	49.62	66.32	56.31	43.58	66.23	77.01	70.74	82.69	47.48	36.62	58.47	25.47	14.77	36.70
West Darfur State	63.33	52.53	74.13	48.16	37.78	58.54	78.89	71.89	85.89	39.04	30.85	47.22	37.29	27.07	47.51
Zalingi	31.91	22.39	41.44	10.77	5.84	17.72	61.84	55.64	68.13	9.82	5.48	15.34	33.19	28.57	39.55
Wadi Salih	47.66	37.41	56.30	44.31	32.02	55.54	95.33	91.85	97.90	14.40	8.31	21.41	29.71	21.42	37.97
Mukjar	60.09	53.24	66.01	10.82	6.35	16.78	77.55	65.40	88.89	10.34	2.53	21.79	44.89	37.16	53.90
Central Jebel Mara	23.53	14.37	34.85	5.97	1.44	11.69	79.43	70.19	88.16	6.57	1.49	12.68	72.22	61.43	81.49
North Jebel Mara	11.72	4.82	20.01	5.56	0.71	12.76	86.11	74.83	94.92	2.84	0.00	8.28	63.95	50.33	75.90
Bendasi	53.11	42.94	65.14	16.72	11.55	22.48	91.42	86.57	95.42	22.30	14.49	29.51	11.92	7.59	17.15
Nertiti	48.82	29.86	67.45	21.34	16.15	27.14	84.72	80.00	89.23	23.77	15.91	32.09	23.81	17.39	31.08
Azum	96.64	90.54	99.49	88.11	81.01	93.48	94.40	90.95	97.20	82.35	69.42	88.25	69.25	59.93	75.52
Um Dukhun	41.80	25.46	57.39	45.00	37.68	52.11	68.03	60.25	73.85	34.65	28.99	40.57	31.41	24.39	39.85
Central Darfur State	43.45	32.61	54.28	25.59	18.4	32.79	81.33	73.7	88.95	19.29	12.4	26.18	44.24	35.66	52.82

Spatial distribution of hand-washing events

Figures 366 to 375 show the spatial distribution of hand-washing events.

FIGURE 366:
Carer: WASH: Hand-washing: After defecation (raster)

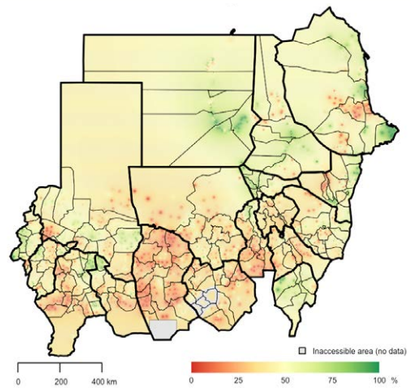


FIGURE 367:
Carer: WASH: Hand-washing: After defecation

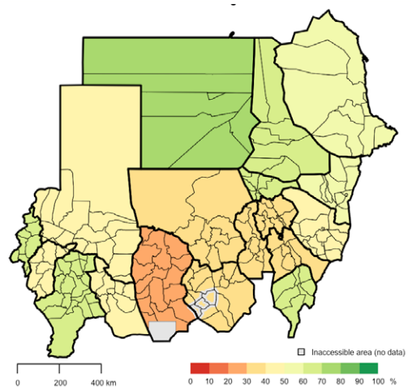


FIGURE 368:
Carer: WASH: Hand-washing: After cleaning child (raster)

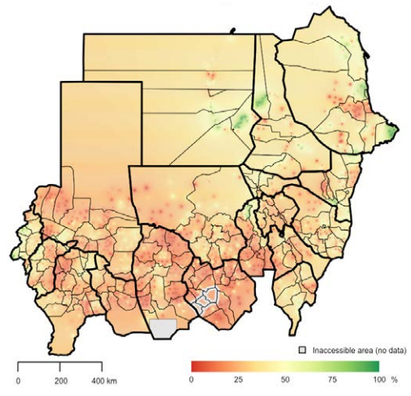


FIGURE 369:
Carer: WASH: Hand-washing: After cleaning child

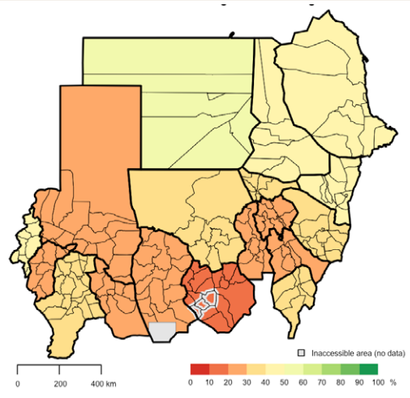


FIGURE 370:
Carer: WASH: Hand-washing before eating (raster)

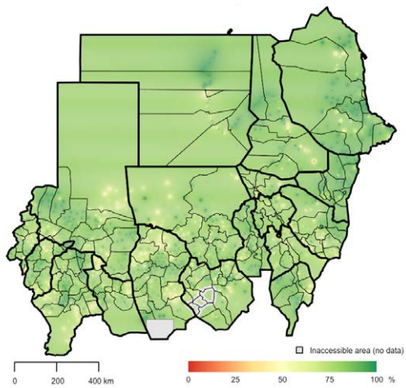


FIGURE 371:
Carer: WASH: Hand-washing before eating

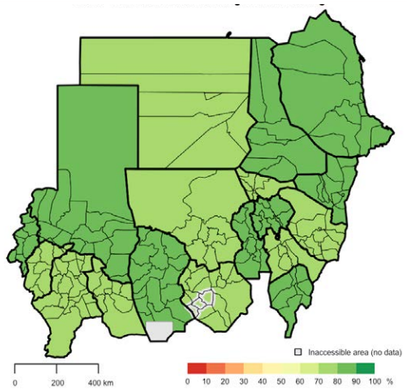


FIGURE 372:
Carer: WASH: Hand-washing: Before feeding child (raster)

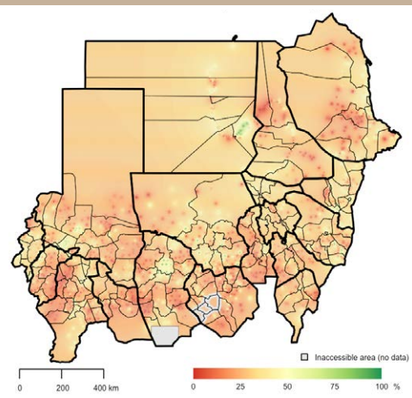


FIGURE 373:
Carer: WASH: Hand-washing: Before feeding child

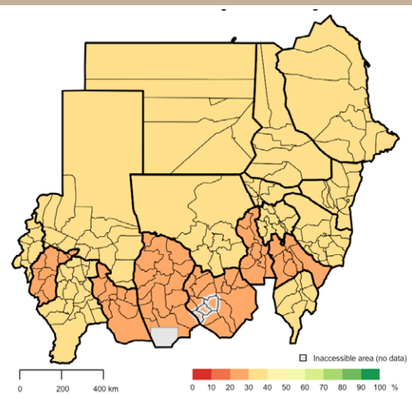


FIGURE 374:
Carer: WASH: Hand-washing: Before preparing food (raster)

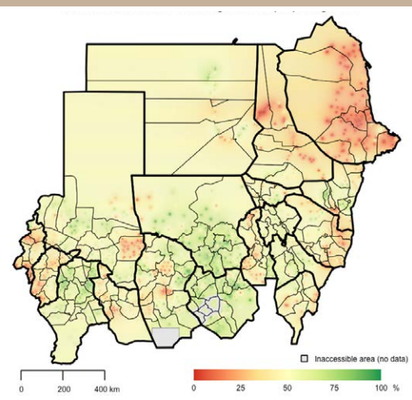
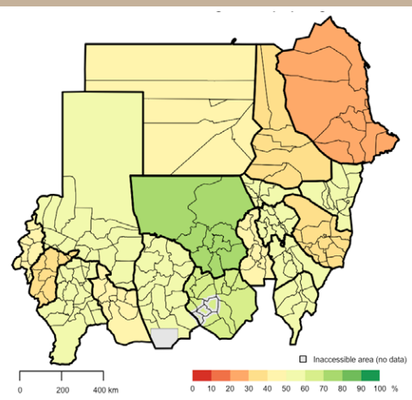


FIGURE 375:
Carer: WASH: Hand-washing: Before preparing food



3.21 Education

3.21.1 Access to preschool education

Access to preschool education average results

The proportion of children with access to preschool education was 53.4 per cent (95 per cent CI: 39.8-67.0). The proportion of male children with access to preschool education was 52.8 per cent (95 per cent CI: 37.2-68.3), while for female children the proportion with access was 54.0 per cent (95 per cent CI: 38.8-69.2).

Northern state had the highest proportion of children with access to preschool education for both males and females, while West Darfur state had the lowest access for both genders *(see Figure 377)*. About 40 per cent of localities have more than 50 per cent of children with access to preschool education *(see Figure 376)*. Table 115 and Table 116 present results by locality, by state and at the national level for access to preschool education.

FIGURE 376: Box plot of locality results of access to preschool education

FIGURE 377: Box plot of state results of access to preschool education

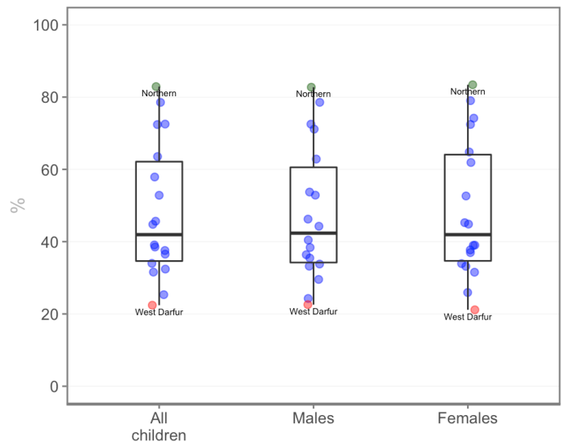


TABLE 115: Access to preschool education by state and national

State	Access to Preschool Education - ALL Children			Access to Preschool Education – MALES			Access to Preschool Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	52.84	38.54	67.15	52.87	36.00	69.73	52.64	36.90	68.37
Al-Gazeera	72.53	57.72	87.35	71.13	55.11	87.15	74.18	58.55	89.82
Blue Nile	45.66	33.64	57.68	46.24	31.22	61.27	45.26	32.19	58.33
Central Darfur	25.33	7.89	42.78	24.28	4.65	43.90	25.93	8.06	43.80
East Darfur	32.42	20.50	44.35	33.21	19.86	46.56	31.55	18.64	44.46
Kassala	34.00	22.20	45.80	33.82	18.96	48.68	33.92	20.45	47.38
Khartoum	78.55	66.30	90.80	78.55	64.32	92.78	79.03	65.40	92.65
North Darfur	44.79	27.52	62.07	44.27	27.25	61.29	44.86	26.83	62.89
North Kordofan	31.58	20.33	42.83	29.55	17.44	41.66	33.19	19.54	46.83
Northern	82.91	72.06	93.76	82.74	69.41	96.07	83.41	70.05	96.77
Red Sea	38.52	20.88	56.15	40.45	17.97	62.94	36.98	17.14	56.82
River Nile	72.41	60.05	84.78	72.51	57.59	87.43	72.43	57.14	87.73
Sennar	63.55	51.39	75.72	62.86	48.62	77.10	64.81	50.15	79.47
South Darfur	39.09	25.59	52.59	38.38	22.81	53.94	39.02	23.28	54.75
South Kordofan	37.55	23.40	51.70	36.39	18.30	54.49	38.97	22.19	55.74
West Darfur	22.41	12.95	31.87	22.57	11.86	33.28	21.15	10.78	31.51
West Kordofan	36.55	22.95	50.16	35.46	20.11	50.81	37.72	21.40	54.04
White Nile	57.90	45.47	70.34	53.72	39.12	68.33	61.90	47.25	76.55
Sudan	53.40	39.84	66.96	52.76	37.23	68.29	54.02	38.83	69.21

TABLE 116: Access to preschool education by locality and by state

Location	Access to Preschool Education - ALL Children			Access to Preschool Education – MALES			Access to Preschool Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	82.98	71.47	92.00	85.38	73.37	93.61	81.33	68.52	91.34
El Golid	75.25	65.02	84.66	66.15	50.00	80.71	84.04	71.90	94.66
Merwoe	72.28	55.26	87.21	74.04	55.76	90.01	70.48	56.21	89.69
El Daba	93.10	83.19	98.56	93.41	82.81	100.00	93.41	82.42	100.00
Halfa	96.05	92.71	98.53	94.80	89.18	98.69	98.35	92.41	100.00
Delgo	90.62	83.41	95.82	88.41	77.74	96.78	92.31	84.96	97.99
El Burgaig	83.05	72.04	92.19	83.64	73.07	91.60	83.33	70.56	95.34
Northern State	82.91	72.06	93.76	82.74	69.41	96.07	83.41	70.05	96.77
El Matama	62.31	50.17	73.58	63.93	49.50	77.64	58.47	43.09	77.88
Shendi	65.51	46.21	79.35	62.84	40.73	80.77	65.50	48.44	79.34
Abu Hamad	77.69	66.41	87.19	75.21	60.65	88.22	80.34	68.10	90.66
Barbar	81.30	62.72	91.56	89.09	69.11	100.00	74.65	47.69	90.02
El Damar	72.89	63.81	82.15	73.14	61.82	83.00	74.37	62.75	83.46
Atbara	85.62	76.31	91.79	79.13	66.42	89.75	89.61	78.88	96.24
El Buhaira	71.56	56.88	84.05	75.49	63.55	84.82	67.23	46.66	86.49
River Nile State	72.41	60.05	84.78	72.51	57.59	87.43	72.43	57.14	87.73
Khartoum	91.19	85.07	96.09	91.50	81.30	98.21	91.35	82.85	97.56
Bahri	81.96	71.72	89.08	82.91	71.83	91.35	80.65	66.32	88.89
Um Durman	81.20	70.37	88.37	81.97	70.21	89.53	81.08	71.75	88.46
Um Bada	75.32	55.31	87.78	73.73	52.65	90.34	77.14	57.03	90.09
Jebel Awlia	82.76	72.17	91.72	81.67	68.21	93.88	82.47	69.89	91.22
Sharg Elneel	64.51	49.99	78.68	62.66	45.77	75.22	68.99	50.66	82.64
Karrari	80.41	70.95	88.82	85.16	72.88	93.97	76.44	62.58	88.15
Khartoum State	78.55	66.30	90.80	78.55	64.32	92.78	79.03	65.40	92.65
Greater Medani	83.09	74.10	90.29	84.30	71.14	92.58	81.51	71.18	91.05
Ganub Elgazira	86.43	75.17	95.44	86.93	75.18	95.39	85.56	72.95	96.28
El Hassahisa	79.65	71.48	87.50	76.58	64.64	85.99	82.81	69.44	93.06
El Kamlin	75.97	60.68	88.64	73.03	55.29	87.71	78.77	57.88	92.48
Sharg El Gezira	64.98	49.36	78.23	60.68	39.50	77.45	66.23	48.47	81.21
Um Elqura	65.43	51.16	79.05	59.33	40.70	76.31	71.30	57.57	83.35
El Manaqil	56.94	38.34	72.50	59.09	40.65	76.30	56.41	36.87	72.89
El Qurashi	75.26	54.66	89.53	72.48	49.53	86.96	77.70	56.65	92.95
Al-Gazeera State	72.53	57.72	87.35	71.13	55.11	87.15	74.18	58.55	89.82
Sennar	84.21	74.29	90.73	82.61	72.77	90.32	84.97	73.50	93.46
Sharg Sennar	53.33	37.57	69.09	44.52	26.98	61.04	60.87	41.96	77.86
Sinja	82.05	69.95	90.58	80.75	66.03	90.58	84.05	69.30	92.81

TABLE 116: Access to preschool education by locality and by state

Location	Access to Preschool Education - ALL Children			Access to Preschool Education – MALES			Access to Preschool Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Hujar	34.80	22.05	50.63	39.13	23.23	53.27	30.14	15.11	48.72
El Dali	44.84	30.65	60.38	42.86	25.17	63.31	46.25	31.10	62.11
Es Suki	67.47	54.86	79.29	68.18	54.27	82.36	66.67	51.35	81.20
Ed Dinder	51.61	38.86	62.35	56.25	42.14	66.14	46.99	31.33	59.89
Sennar State	63.55	51.39	75.72	62.86	48.62	77.10	64.81	50.15	79.47
Ed Damazine	68.67	55.61	80.09	64.45	52.96	77.15	73.87	58.31	84.84
El Tadamon	32.28	23.79	41.54	43.08	27.27	58.33	20.25	9.87	34.69
El Roseiris	51.84	42.63	62.77	49.52	36.53	60.97	55.42	43.77	65.22
Baw	31.00	20.87	41.15	26.97	16.04	39.53	33.68	19.80	46.48
Geisan	23.53	14.41	34.68	21.90	12.27	31.55	27.00	11.96	43.34
El Kurmuk	22.41	8.72	35.92	31.75	10.41	47.06	13.64	2.93	28.21
Wad El Mahi	53.97	39.45	70.29	60.37	42.03	76.84	49.12	33.65	64.95
Blue Nile State	45.66	33.64	57.68	46.24	31.22	61.27	45.26	32.19	58.33
Kosti	56.57	44.67	67.48	51.43	36.24	64.63	61.78	46.34	75.95
Guli	68.52	56.55	79.00	63.56	48.97	78.06	74.40	56.70	87.13
Tendalti	39.10	24.75	54.97	33.86	20.13	50.51	45.60	27.27	60.99
Es Salam	28.04	11.02	48.42	23.57	8.72	42.88	32.17	12.80	52.78
Rabak	73.58	62.96	82.87	68.37	53.91	80.73	80.61	67.85	91.31
El Jabalain	54.55	39.82	69.29	55.03	38.59	70.32	54.49	38.98	69.64
El Diwaim	53.25	40.28	65.88	53.85	40.93	65.25	52.71	37.92	66.85
Um Rimta	51.65	37.18	63.85	43.30	27.95	56.93	56.78	41.23	73.65
El Gitaina	74.31	62.61	84.75	68.99	50.86	83.76	79.82	64.70	91.27
White Nile State	57.90	45.47	70.34	53.72	39.12	68.33	61.90	47.25	76.55
Port Sudan	88.97	81.54	94.76	89.17	77.94	96.94	88.37	79.68	96.38
Swakin	17.24	8.18	27.76	17.31	7.06	29.73	16.03	7.02	29.16
El Gonob Welawlaib	32.05	20.00	45.86	31.30	20.31	45.91	33.71	18.86	49.50
Sinkat	38.91	23.02	51.37	37.50	17.89	54.77	39.10	20.82	52.44
Haya	28.00	4.39	53.73	28.57	2.76	57.93	26.83	3.32	55.57
Dordieb	23.70	7.44	43.05	29.17	4.96	53.14	19.78	4.90	43.76
Tokar	17.65	5.67	31.42	23.81	8.84	45.01	8.57	0.00	22.14
Agig	27.46	10.95	44.83	39.13	18.15	56.85	15.52	3.07	29.74
Gabaot Elma-aadin	46.05	24.57	67.16	32.38	13.84	55.05	67.31	37.08	87.74
Halaeeb (accessible parts)	15.15	0.00	30.00	19.23	0.00	50.00	8.33	0.00	31.59
Red Sea State	38.52	20.88	56.15	40.45	17.97	62.94	36.98	17.14	56.82
Kassala Town	73.67	61.56	83.04	70.43	55.47	83.39	77.11	61.52	88.50

TABLE 116: Access to preschool education by locality and by state

Location	Access to Preschool Education - ALL Children			Access to Preschool Education – MALES			Access to Preschool Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi Kassla	32.66	25.28	41.59	36.86	27.35	48.69	28.21	17.67	40.01
Rural Western Kassala	6.27	2.65	10.96	6.43	1.98	13.40	5.67	1.42	12.04
New Halfa	61.56	46.74	75.39	59.89	42.85	76.09	63.27	48.24	78.92
Refi Nahr Atbara	34.80	22.09	48.66	27.00	13.79	43.01	40.74	23.47	57.77
Rural Khashm Elgirba	55.95	41.62	70.81	50.98	30.64	69.92	61.70	45.68	78.50
Rural Wad Elhilaiw	32.67	22.17	45.69	32.31	17.96	47.99	33.95	22.63	48.34
Rural Aroma	7.00	0.9	14.64	9.72	1.58	20.02	3.79	0.00	12.50
Refi North Delta	9.84	1.62	25.79	10.61	1.98	23.82	8.93	0.00	38.63
Refi Hamashkureib	4.71	1.42	9.5	7.23	1.93	15.74	0.00	0.00	4.27
Rural Telkok	13.29	1.6	31.17	16.67	1.33	38.98	9.09	0.00	27.17
Kassala State	34.00	22.20	45.80	33.82	18.96	48.68	33.92	20.45	47.38
Gedaref Town	75.25	64.83	84.62	72.12	57.60	87.36	79.39	67.77	89.48
Middle Geddaref	75.09	54.86	88.39	73.08	49.64	88.99	75.52	54.36	89.35
Elbutana	25.00	14.98	37.16	25.00	14.23	37.02	25.40	11.57	40.30
El Fashaga	65.90	50.54	81.58	61.90	41.55	82.12	69.33	50.90	82.09
El Rahad	47.19	31.57	62.67	54.30	33.93	73.15	40.95	24.22	57.90
Gala-a El Nahal	53.78	32.56	69.88	45.79	22.30	64.86	62.86	40.61	80.17
El Fao	54.34	42.35	63.71	61.82	46.57	76.01	47.12	33.32	59.90
El Qureisha	47.14	28.51	67.88	47.79	24.99	70.75	47.93	27.76	67.83
El Mafaza	21.86	10.52	34.86	15.32	5.88	29.85	26.81	11.88	44.55
Basunda	45.30	31.46	57.31	43.51	29.19	57.06	46.67	30.21	62.02
Western Galabat	48.79	34.33	62.48	48.70	32.85	64.82	48.85	31.45	65.45
Eastern Galabat	50.63	38.28	61.63	54.82	42.35	66.68	46.41	31.64	60.77
Al-Gadarif State	52.84	38.54	67.15	52.87	36.00	69.73	52.64	36.90	68.37
Sheikan	41.99	35.55	49.14	39.49	29.78	49.64	44.88	37.00	52.49
Um Rawaba	45.63	30.94	61.24	45.33	31.44	58.61	48.52	31.52	64.23
Um Dam Haj Ahmed	25.57	14.87	38.72	26.00	12.97	42.75	23.36	11.21	37.31
El Rahad	39.92	27.11	58.00	38.78	25.40	54.60	42.11	22.80	66.07
Bara	24.74	14.37	39.19	18.02	8.43	31.92	31.25	18.22	47.58
Gharb Bara	16.33	8.28	26.20	17.96	8.77	30.21	14.29	5.16	26.27
Soudari	15.11	8.32	26.09	13.33	4.84	24.02	18.45	9.04	30.06
Gebrat El Sheikh	14.72	5.1	26.89	14.94	3.9	26.50	13.89	4.91	29.95
North Kordofan State	31.58	20.33	42.83	29.55	17.44	41.66	33.19	19.54	46.83
Kadugli	64.86	56.65	72.79	61.18	52.44	70.24	68.12	55.36	79.09

TABLE 116: Access to preschool education by locality and by state

Location	Access to Preschool Education - ALL Children			Access to Preschool Education – MALES			Access to Preschool Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Reif Shargi	45.48	31.62	58.22	48.78	34.02	64.19	39.01	24.22	54.58
Dilling	37.89	22.19	52.52	26.85	12.98	44.45	51.43	26.46	69.24
El Quoz	27.89	20.60	37.65	25.16	14.09	37.00	30.81	19.64	43.43
Habila	63.94	48.73	78.41	62.09	46.02	77.96	64.88	46.75	81.17
Abassiya	42.04	25.53	57.01	42.50	24.06	59.74	41.06	22.97	62.12
El Rashad	48.40	34.00	63.15	45.81	26.70	64.10	49.64	31.36	66.69
Abu Jubaiha	19.22	6.62	32.18	20.41	4.33	39.74	17.88	5.52	35.82
El Tadamon	25.73	16.75	35.17	27.51	15.96	40.20	22.50	12.49	37.11
Talodi	40.00	19.93	54.76	39.47	19.98	56.89	41.67	17.93	62.24
Ghadeer	29.11	14.20	47.43	36.26	17.56	58.49	24.71	9.84	42.19
El Leri	42.73	28.52	56.67	43.15	28.38	59.62	42.14	25.49	57.39
Abu Karshola	40.29	21.75	58.21	38.03	8.08	61.95	39.50	23.62	53.71
Delami	54.73	34.52	78.41	58.56	33.69	78.89	50.00	22.19	81.69
South Kordofan State	37.55	23.40	51.70	36.39	18.30	54.49	38.97	22.19	55.74
Abu Zabad	44.05	28.65	58.44	39.90	20.61	58.35	50.41	36.87	63.91
ElKhiwai	50.90	34.43	66.93	50.36	31.13	67.36	49.57	30.03	68.44
Ghubaish	40.06	27.78	52.35	46.48	30.80	60.36	34.87	21.35	48.13
El Nuhud	29.01	20.03	39.41	24.75	16.43	33.98	32.75	19.45	47.28
El Idia	56.11	37.66	73.59	56.76	37.48	74.44	54.30	36.88	74.73
Wad Benda	9.12	4.42	14.99	7.91	2.04	16.43	9.19	3.06	17.67
Lagawa	44.72	32.06	60.71	48.31	29.57	65.76	44.23	28.44	59.20
Elsunut	35.68	17.56	55.78	40.17	18.40	61.61	31.13	12.72	52.31
Keilik	48.19	38.22	56.54	43.18	31.76	54.35	52.52	40.23	64.24
Es Salam	53.45	41.60	66.60	54.88	41.71	69.89	53.03	38.20	68.49
Babanusa	43.65	28.82	55.08	38.24	23.63	53.09	48.94	33.89	63.30
Abyei	27.78	13.17	45.38	17.54	7.14	33.33	33.77	12.94	55.39
El Dibab	17.70	4.38	33.65	17.54	2.31	37.86	20.41	6.24	37.15
El Meiram	45.80	29.86	57.02	39.13	22.72	54.24	51.72	34.66	66.67
West Kordofan State	36.55	22.95	50.16	35.46	20.11	50.81	37.72	21.40	54.04
El Fasher	69.59	62.14	77.90	67.33	58.53	77.04	72.73	63.01	80.83
Tawila	27.30	14.52	44.18	20.38	9.32	37.23	33.85	16.65	52.38
Melit	26.54	7.81	48.99	30.14	10.23	52.58	23.76	7.01	44.95
Um Kadada	67.41	54.28	78.78	63.89	48.54	77.09	70.57	58.08	83.54
Kebkabiya	30.57	21.32	39.69	30.60	20.97	44.02	29.89	18.07	45.12

TABLE 116: Access to preschool education by locality and by state

Location	Access to Preschool Education - ALL Children			Access to Preschool Education – MALES			Access to Preschool Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kutum	50.63	36.89	66.05	46.22	31.05	61.07	58.64	37.52	76.27
El Mahalha	34.96	22.30	46.99	36.54	23.64	48.14	34.83	18.27	51.17
Saraf Omra	33.55	15.85	50.98	39.60	17.09	57.47	27.42	10.14	45.96
El Serief	24.17	12.68	36.76	26.27	12.48	43.14	20.63	8.57	37.00
Dar Elsalam	37.83	21.78	55.44	37.18	18.11	56.31	39.23	23.99	57.70
Kelemando	45.25	29.84	60.74	48.20	30.78	67.24	39.69	25.22	55.08
El Tawisha	57.14	43.98	67.96	61.08	46.96	73.13	52.88	39.88	65.99
Um Baru	36.32	16.82	55.15	35.71	13.04	56.35	37.74	16.36	58.57
El Lait	68.54	57.61	77.07	66.03	52.71	78.47	72.14	58.66	83.03
ELkuma	70.64	37.82	93.83	74.14	32.38	100.00	70.37	32.42	92.16
El Tina	20.00	0.00	66.67	0.00	0.00	0.00	25.00	0.00	66.67
Kernoi	17.08	9.31	28.54	14.71	7.07	24.71	18.93	7.71	35.15
North Darfur State	44.79	27.52	62.07	44.27	27.25	61.29	44.86	26.83	62.89
Nyala South	79.79	71.65	88.52	82.70	73.65	89.72	76.69	65.24	86.85
Nyala North	87.01	76.19	98.24	93.75	80.00	100.00	79.31	60.00	95.65
Es Salam	37.80	27.00	48.78	36.51	23.14	51.45	36.36	22.50	48.26
El Wihda	22.63	6.15	40.91	19.64	4.12	38.77	20.39	5.46	43.44
Mershing	32.59	19.56	46.39	41.32	24.73	58.88	25.23	13.31	39.06
Beliel	48.02	39.24	56.79	48.34	37.08	58.22	46.86	35.39	58.11
Nitega	52.43	32.15	71.49	50.00	26.40	72.76	54.88	31.36	73.13
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kas	13.03	6.96	20.33	14.20	7.13	23.14	11.81	4.97	22.40
Shattaya	9.65	3.7	17.09	7.8	2.00	17.07	11.61	1.9	24.26
Buram	27.87	15.79	40.27	24.84	14.08	41.49	28.47	15.02	43.31
Gereida	76.54	56.74	90.49	71.74	48.90	90.28	80.00	59.42	93.39
El Sunta	13.98	2.86	27.21	17.65	3.7	39.62	6.45	0.00	24.00
El Radoum	17.84	6.44	31.14	19.12	6.72	35.74	15.60	3.79	31.10
Tulus	54.76	30.49	80.00	41.94	20.56	80.00	63.89	37.47	91.46
Damso	11.93	3.56	21.51	9.43	1.54	21.05	15.56	2.77	33.87
Ed Elfursan	20.97	10.75	35.30	20.00	7.98	35.86	21.11	9.95	36.82
Kubum	39.71	24.27	51.94	42.20	24.83	56.45	36.12	20.72	52.57
Kateila	34.22	20.97	50.00	31.43	17.32	46.07	42.35	25.52	58.84
Rehaid Elbirdi	10.47	4.03	19.48	6.59	0.93	16.50	13.04	4.27	25.02
Um Dafoug	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
South Darfur State	39.09	25.59	52.59	38.38	22.81	53.94	39.02	23.28	54.75

TABLE 116: Access to preschool education by locality and by state

Location	Access to Preschool Education - ALL Children			Access to Preschool Education – MALES			Access to Preschool Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Jabra	19.36	10.32	28.09	21.30	11.20	32.39	17.35	7.87	26.24
Abu Karinka	55.11	39.53	70.69	52.83	37.76	68.80	57.14	37.31	78.86
Bahr El Arab	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00	6.67
Adila	44.21	30.99	60.17	49.21	29.44	72.73	39.42	25.84	50.79
Ed Dain	70.32	58.92	80.22	70.69	57.33	82.69	69.71	56.32	79.52
Assalaya	18.23	12.09	26.40	18.55	10.29	27.25	16.84	10.39	26.16
El Firdous	11.55	4.75	18.69	14.09	5.34	25.22	8.96	3.25	16.56
Shia-ria	48.60	29.89	67.85	47.37	29.40	69.32	47.86	29.56	65.75
Yassin	36.50	24.84	45.87	32.22	21.00	43.59	39.00	21.77	54.56
East Darfur State	32.42	20.50	44.35	33.21	19.86	46.56	31.55	18.64	44.46
El Geneina	41.56	30.31	52.62	41.32	29.59	53.50	40.78	29.64	52.28
Habila	6.03	2.23	12.79	7.41	1.36	16.03	4.11	0.00	9.70
Kulbus	14.75	4.81	30.95	17.05	4.72	33.63	14.29	3.87	30.40
Beida	8.67	2.63	16.67	5.62	0.98	13.81	11.67	2.78	22.95
Foro Baranga	24.34	17.01	32.38	31.25	21.74	42.08	13.83	6.72	23.18
Kereneik	21.04	15.31	28.50	23.40	15.91	31.50	18.79	10.33	27.99
Sirba	15.07	7.55	24.22	12.67	5.87	21.16	17.01	7.19	28.27
Jebel Moon	8.00	2.05	16.16	7.07	1.06	15.45	8.45	1.51	19.10
West Darfur State	22.41	12.95	31.87	22.57	11.86	33.28	21.15	10.78	31.51
Zalingi	39.24	28.54	50.52	42.14	30.38	54.59	34.50	22.88	47.69
Wadi Salih	36.32	21.80	53.96	33.33	16.82	50.00	40.00	22.59	61.20
Mukjar	18.80	3.57	39.74	21.48	4.38	42.79	13.51	0.81	34.63
Central Jebel Mara	51.81	21.22	85.71	44.68	13.45	82.97	58.95	28.16	83.71
North Jebel Mara	2.38	0.00	10.23	2.56	0.00	13.19	2.5	0.00	11.46
Bendasi	12.89	5.1	20.75	13.33	3.57	24.83	12.79	4.76	24.40
Nertiti	46.58	34.51	59.31	40.00	24.99	53.98	54.20	38.69	68.50
Azum	6.45	3.18	10.45	8.08	3.12	13.92	4.42	0.00	12.52
Um Dukhun	7.73	1.82	16.26	4.63	0.00	14.68	9.52	2.45	19.80
Central Darfur State	25.33	7.89	42.78	24.28	4.65	43.90	25.93	8.06	43.80

Spatial distribution of access to preschool education

There was a belt of low access to preschool education that began in the east of Sudan in Red Sea state and extended down into the south in Blue Nile state and then moved towards the Kordofans. The Darfurs were separated by an area of high access to preschool education in the center of Sudan in Sennar, Al-Gazeera and Khartoum upwards to River Nile and Northern states *(see Figure 378)*.

FIGURE 378:
Education: Access to preschool education - ALL children (raster)

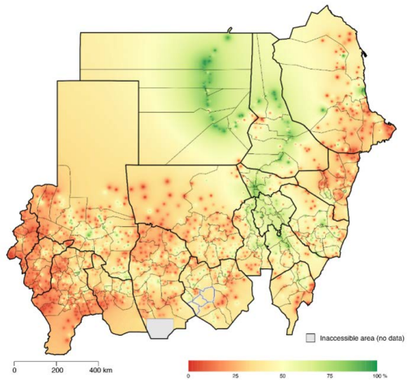


FIGURE 379:
Education: Access to preschool education - ALL children

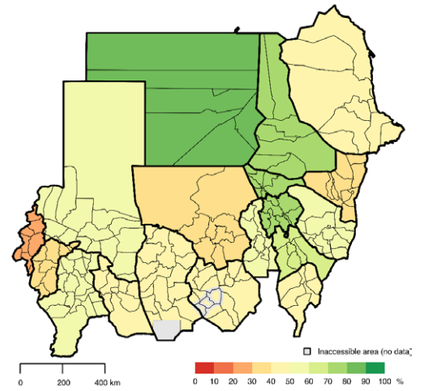


FIGURE 380:
Education: Access to preschool education - MALES (raster)

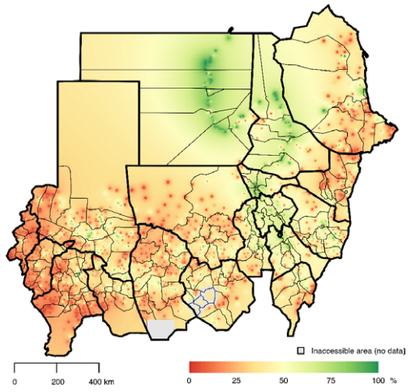


FIGURE 381:
Education: Access to preschool education - MALES

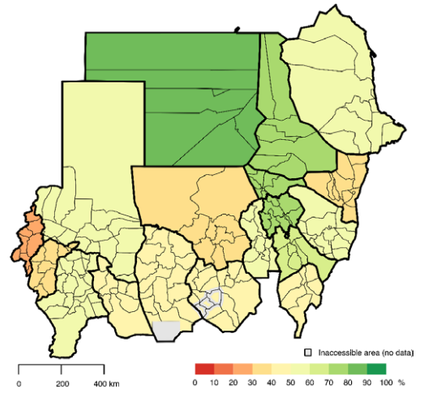


FIGURE 382:
Education: Access to preschool education - FEMALES (raster)

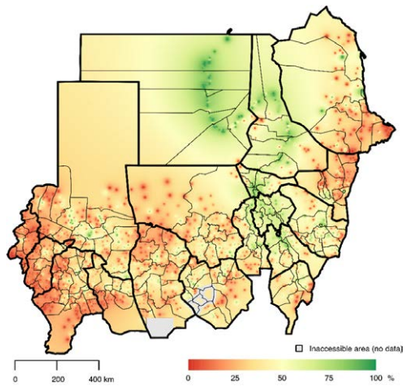
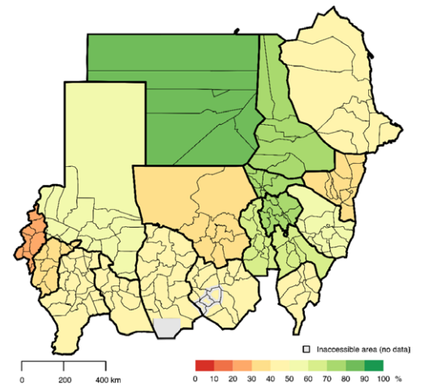


FIGURE 383:
Education: Access to preschool education – FEMALES



3.21.2 Access to basic education

Access to basic education average results

The proportion of children with access to basic education was 80.8 per cent (95 per cent CI: 70.6-91.1 per cent). The proportion of male children with access to basic education was 82.0 per cent (95 per cent CI: 70.3-93.6 per cent), while for female children the proportion with access was 79.6 per cent (95 per cent CI: 67.8-91.4 per cent). Northern state had the highest proportion of children with access to basic education for both males and females, while Central Darfur state had the lowest access for both genders *(see Figure 385).* About 90.8 per cent of localities had greater than 50 per cent of children with access to basic education *(see Figure 384).*

Table 117 and Table 118 present results by locality, by state, and at the national level for access to basic education.

FIGURE 384: Box plot of locality results of access to basic education

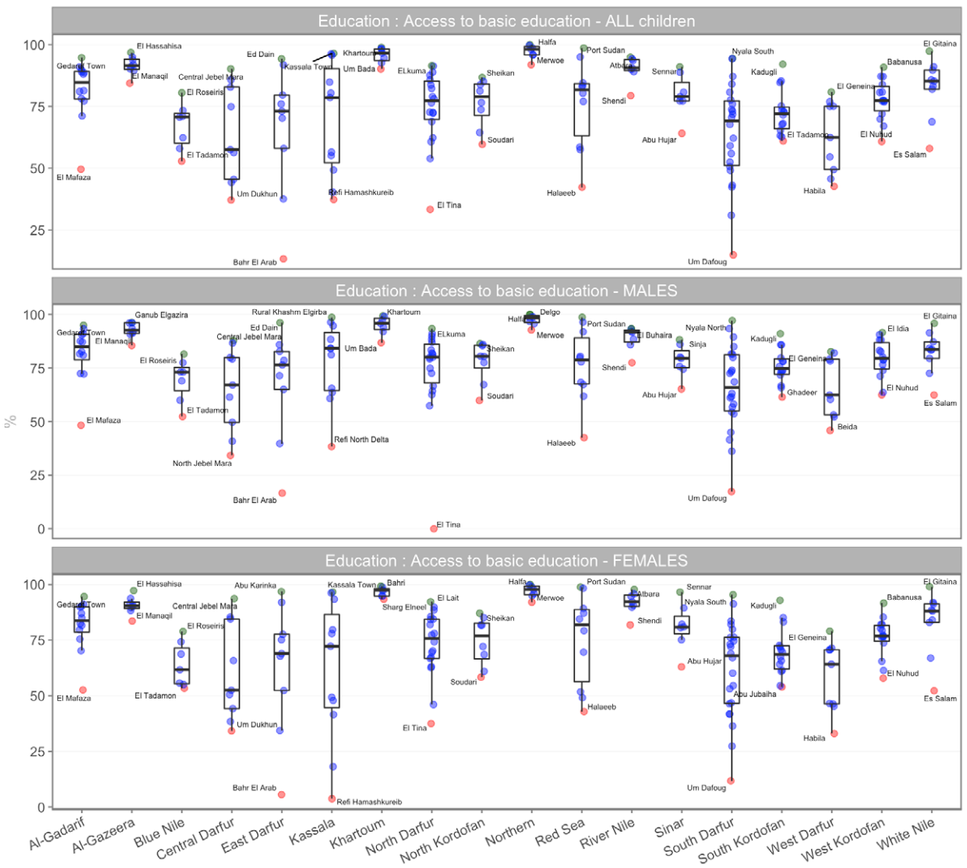


FIGURE 385: Box plot of state results of access to basic education proportion

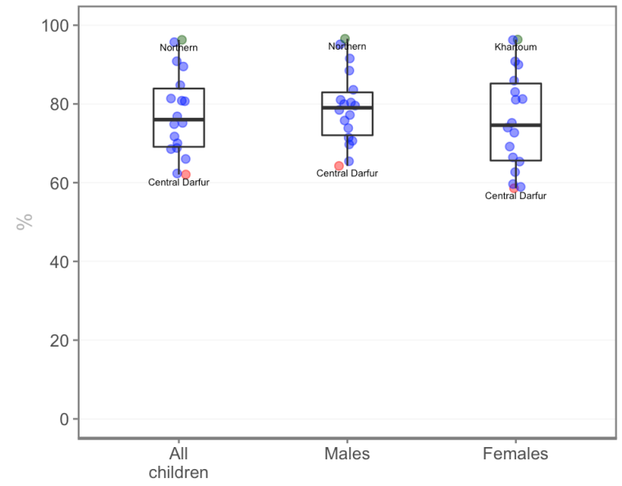


TABLE 117: Access to basic education by state and national

State	Access to Basic Education - ALL children			Access to Basic Education – MALES			Access to Basic Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	80.82	70.15	91.49	81.03	68.79	93.27	81.25	69.67	92.82
Al-Gazeera	90.85	84.18	97.52	91.54	85.45	97.64	89.97	82.03	97.91
Blue Nile	71.74	59.77	83.70	73.86	61.71	86.01	69.17	55.49	82.85
Central Darfur	62.08	45.07	79.10	64.26	46.49	82.03	58.58	40.14	77.02
East Darfur	62.34	50.79	73.89	65.43	39.96	90.90	58.92	44.85	73.00
Kassala	70.00	58.97	81.02	79.58	69.15	90.01	59.65	45.12	74.17
Khartoum	95.70	91.35	99.99	95.15	89.70	99.99	96.34	92.16	99.99
North Darfur	75.17	63.56	86.77	75.78	64.45	87.12	74.00	60.90	87.11
North Kordofan	76.85	68.47	85.23	78.47	69.34	87.59	75.19	65.69	84.68
Northern	96.28	92.06	99.99	96.55	92.11	99.99	96.25	91.08	99.99
Red Sea	81.37	64.14	98.60	79.95	59.88	99.99	83.04	64.71	99.99
River Nile	89.51	82.40	96.63	88.47	79.38	97.56	90.80	83.27	98.33
Sennar	80.68	69.88	91.48	80.36	69.12	91.60	81.07	69.23	92.90
South Darfur	68.81	56.73	80.89	70.62	57.92	83.31	66.43	50.47	82.39
South Kordofan	68.53	54.96	82.10	71.44	58.43	84.45	65.35	50.65	80.05
West Darfur	66.02	52.90	79.13	69.72	56.16	83.29	62.70	47.69	77.71
West Kordofan	74.86	62.46	87.26	77.19	65.10	89.27	72.69	59.26	86.11
White Nile	84.76	74.57	94.95	83.58	73.40	93.76	85.91	74.54	97.28
Sudan	80.82	70.55	91.09	81.95	70.34	93.57	79.57	67.77	91.37

TABLE 118: Access to basic education by locality and by state

Location	Access to Basic Education - ALL children			Access to Basic Education – MALES			Access to Basic Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	96.14	92.95	98.71	96.32	91.55	99.25	96.10	92.24	98.91
El Golid	95.79	91.84	99.00	97.01	91.07	100.00	95.00	90.05	98.85
Merwoe	92.07	84.72	97.58	92.02	81.68	98.46	91.15	81.86	98.81
El Daba	98.69	95.26	100.00	98.53	94.59	100.00	99.09	95.85	100.00
Halfa	100.00	99.54	100.00	100.00	99.32	100.00	100.00	100.00	100.00
Delgo	99.47	98.31	100.00	100.00	98.70	100.00	99.28	97.07	100.00
El Burgaig	98.48	95.54	100.00	99.16	95.90	100.00	98.32	92.63	100.00
Northern State	96.28	92.06	99.99	96.55	92.11	99.99	96.25	91.08	99.99
El Matama	89.82	86.38	93.02	91.17	86.14	94.89	88.81	82.79	93.60
Shendi	79.81	66.56	89.32	78.29	63.16	89.87	81.46	69.17	90.81
Abu Hamad	96.99	92.29	99.28	95.78	90.69	99.04	97.91	92.64	100.00
Barbar	89.01	70.08	96.24	86.63	69.22	95.99	91.40	74.73	99.32
El Damar	92.20	86.57	95.92	90.57	83.69	95.30	93.89	89.33	97.59
Atbara	96.36	92.07	99.07	96.26	91.99	99.19	96.76	91.73	99.30
El Buhaira	94.27	89.94	97.18	93.37	89.57	96.40	95.49	89.72	98.92
River Nile State	89.51	82.40	96.63	88.47	79.38	97.56	90.80	83.27	98.33
Khartoum	98.89	96.51	100.00	99.17	96.55	100.00	98.65	95.21	100.00
Bahri	97.97	92.37	99.79	96.99	91.25	100.00	98.92	94.02	100.00
Um Durman	96.54	93.28	98.78	95.78	91.48	99.12	97.57	94.22	99.49
Um Bada	94.18	83.47	98.04	91.88	81.45	97.63	96.96	81.46	99.62
Jebel Awlia	98.44	96.57	99.75	99.14	96.57	100.00	97.77	94.17	100.00
Sharg Elneel	91.46	85.02	97.13	90.75	84.39	96.38	92.78	85.78	97.55
Karrari	93.74	89.33	96.71	93.42	87.01	98.34	93.68	88.79	97.49
Khartoum State	95.70	91.35	99.99	95.15	89.70	99.99	96.34	92.16	99.99
Greater Medani	92.09	85.94	96.81	92.82	87.13	97.60	90.81	83.68	96.72
Ganub Elgazira	93.26	87.31	97.86	94.77	88.29	98.53	91.90	84.36	97.16
El Hassahisa	96.41	93.47	98.53	95.98	90.86	99.18	97.30	94.77	99.29
El Kamlin	90.80	79.88	95.42	91.10	82.61	96.69	90.48	75.98	96.60
Sharg El Gezira	88.55	78.41	96.37	89.88	80.18	97.54	87.46	76.66	94.74
Um Elqura	94.16	90.08	97.09	95.33	91.43	98.39	92.77	85.01	97.89
El Manaqil	84.90	76.00	91.62	85.67	75.97	92.40	84.09	70.24	93.31
El Qurashi	90.67	85.16	94.62	91.52	86.60	95.64	89.96	83.61	95.55
Al-Gazeera State	90.85	84.18	97.52	91.54	85.45	97.64	89.97	82.03	97.91
Sennar	90.51	85.82	94.08	86.07	80.15	91.63	95.61	91.86	98.48
Sharg Sennar	77.26	64.21	91.18	80.65	63.51	94.59	74.22	54.61	88.53
Sinja	88.94	83.96	92.74	87.70	81.27	93.03	90.07	83.93	93.81
Abu Hujar	65.69	51.56	77.34	67.93	53.54	79.49	63.60	47.35	77.69
El Dali	73.68	61.47	83.33	71.93	58.58	81.39	74.55	59.18	85.68

TABLE 118: Access to basic education by locality and by state

Location	Access to Basic Education - ALL children			Access to Basic Education – MALES			Access to Basic Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Es Suki	78.10	69.71	87.55	79.21	69.40	87.92	77.51	64.78	87.21
Ed Dinder	79.40	63.97	88.03	78.99	63.53	90.72	77.75	60.92	90.43
Sennar State	80.68	69.88	91.48	80.36	69.12	91.60	81.07	69.23	92.90
Ed Damazine	81.05	71.58	90.46	82.43	71.64	91.67	81.15	71.02	90.99
El Tadamon	51.52	36.07	67.97	51.72	35.18	70.61	52.54	26.71	75.41
El Roseiris	79.24	70.10	87.18	80.28	68.62	90.56	77.76	68.77	86.06
Baw	59.72	40.00	70.20	64.94	46.83	77.92	52.55	34.02	64.83
Geisan	59.68	42.50	74.71	62.27	43.91	78.63	58.06	40.41	73.85
El Kurmuk	69.68	61.47	79.55	77.40	67.79	87.80	61.75	47.05	76.90
Wad El Mahi	75.56	65.59	83.97	76.05	67.25	83.38	75.54	64.06	84.70
Blue Nile State	71.74	59.77	83.70	73.86	61.71	86.01	69.17	55.49	82.85
Kosti	86.86	79.41	92.18	84.23	75.80	91.83	89.68	81.15	95.14
Guli	92.46	85.96	96.92	92.47	84.58	97.39	91.85	85.32	97.39
Tendalti	76.59	58.83	89.18	75.76	62.19	87.17	76.19	52.96	93.21
Es Salam	55.56	40.43	70.02	60.53	42.37	76.83	51.01	33.50	66.92
Rabak	83.08	73.41	92.65	81.30	69.88	92.16	86.30	73.63	94.13
El Jabalain	82.29	71.33	90.15	80.80	70.71	89.23	84.21	72.84	93.56
El Diwaim	88.25	77.64	95.21	86.57	75.70	94.07	91.12	78.98	97.46
Um Rimta	82.12	68.53	91.43	83.19	69.30	90.79	81.70	65.84	93.67
El Gitaina	94.47	88.88	97.60	92.53	85.64	97.84	96.40	91.10	99.64
White Nile State	84.76	74.57	94.95	83.58	73.40	93.76	85.91	74.54	97.28
Port Sudan	98.27	96.55	99.47	98.26	95.71	99.60	98.51	96.08	100.00
Swakin	62.24	40.90	78.59	69.23	49.03	83.33	56.10	30.45	77.27
El Gonob Welawlaib	67.99	57.41	77.81	68.47	57.14	77.36	68.20	52.50	80.54
Sinkat	77.16	57.79	87.24	67.52	47.52	84.17	85.53	70.78	92.37
Haya	84.29	67.58	95.51	80.67	59.57	94.51	88.68	74.26	97.34
Dordieb	59.51	39.10	78.84	68.59	46.10	84.56	52.38	27.63	71.44
Tokar	84.41	70.10	93.19	80.86	64.45	91.32	88.89	68.14	96.97
Agig	83.72	71.41	95.00	95.20	72.73	100.00	68.00	32.10	100.00
Gabaot Elma-aadin	95.24	90.72	98.00	92.31	83.33	97.74	98.70	94.04	100.00
Halaeeb (accessible parts)	58.82	3.28	89.82	57.50	5.71	91.81	65.45	0.00	90.66
Red Sea State	81.37	64.14	98.60	79.95	59.88	99.99	83.04	64.71	99.99
Kassala Town	96.45	91.76	99.17	96.65	92.37	99.15	96.80	91.37	100.00
Refi Kassla	77.52	66.46	85.56	83.33	70.78	92.15	72.41	61.21	82.41
Rural Western Kassala	56.49	44.43	68.06	61.15	48.43	71.88	50.75	35.85	66.30
New Halfa	94.32	88.00	97.53	92.98	86.77	97.15	95.23	86.88	98.81
Refi Nahr Atbara	80.58	69.94	87.92	83.03	73.93	90.75	76.52	64.44	86.99

TABLE 118: Access to basic education by locality and by state

Location	Access to Basic Education - ALL children			Access to Basic Education – MALES			Access to Basic Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Khashm Elgirba	96.14	92.21	98.66	98.42	94.42	100.00	93.63	88.21	97.71
Rural Wad Elhilaiw	80.17	71.30	86.81	84.70	77.17	91.69	74.39	63.44	85.48
Rural Aroma	44.99	23.30	65.40	46.64	24.63	67.03	44.29	23.00	67.98
Refi North Delta	40.00	21.32	60.30	37.8 0	15.28	59.66	43.86	22.76	66.25
Refi Hamashkureib	37.29	27.94	44.75	65.37	51.07	74.27	5.07	0.62	12.06
Rural Telkok	50.54	34.58	65.49	81.95	69.31	89.91	18.13	0.00	46.63
Kassala State	70.00	58.97	81.02	79.58	69.15	90.01	59.65	45.12	74.17
Gedaref Town	92.94	86.99	97.47	93.15	85.75	97.24	92.46	85.45	97.05
Middle Geddaref	90.84	77.26	98.61	91.37	78.48	98.77	92.07	75.20	99.08
Elbutana	70.49	62.03	76.89	71.06	62.10	79.67	70.22	59.88	78.52
El Fashaga	78.63	64.20	91.44	81.01	65.23	93.89	75.50	58.21	88.19
El Rahad	73.80	56.97	84.93	68.68	50.81	84.48	80.95	65.38	92.15
Gala-a El Nahal	85.79	75.17	91.91	89.56	79.39	95.58	80.60	68.20	91.28
El Fao	88.73	84.29	92.53	91.19	85.34	95.44	87.02	81.36	92.49
El Qureisha	78.62	68.59	89.91	79.66	71.72	89.49	75.71	63.01	90.73
El Mafaza	53.49	36.90	69.12	51.25	33.78	68.11	56.64	36.78	76.75
Basunda	79.07	66.61	88.22	80.19	64.97	88.77	78.26	64.10	89.35
Western Galabat	88.03	82.33	92.44	86.65	78.39	93.40	89.60	84.03	93.23
Eastern Galabat	86.36	78.45	92.12	86.00	78.43	91.58	87.89	78.03	93.95
Al-Gadarif State	80.82	70.15	91.49	81.03	68.79	93.27	81.25	69.67	92.82
Sheikan	84.95	81.32	88.34	84.39	80.38	88.45	85.52	80.76	89.62
Um Rawaba	82.46	72.19	90.75	84.57	74.80	92.82	79.46	68.36	88.71
Um Dam Haj Ahmed	84.07	77.29	90.00	83.73	76.58	90.25	85.01	76.29	91.03
El Rahad	80.06	71.45	87.95	83.38	76.47	90.69	78.03	67.97	87.25
Bara	78.26	71.26	85.92	78.26	68.67	87.81	78.86	70.24	86.15
Gharb Bara	72.20	64.98	79.10	74.37	64.66	83.29	69.05	59.29	76.96
Soudari	57.54	43.25	70.66	60.24	48.49	72.20	54.50	41.26	69.93
Gebrat El Sheikh	66.81	57.06	74.08	73.42	61.31	82.08	60.78	49.51	71.62
North Kordofan State	76.85	68.47	85.23	78.47	69.34	87.59	75.19	65.69	84.68
Kadugli	91.68	89.01	94.21	90.85	86.99	94.50	92.47	89.48	95.23
Reif Shargi	84.53	73.99	93.39	84.88	73.24	92.81	85.19	74.10	95.34
Dilling	69.50	40.61	92.00	73.16	46.03	96.25	67.33	35.99	93.73
El Quoz	70.74	63.24	76.86	70.59	62.27	77.16	71.09	61.44	79.19
Habila	90.25	79.01	96.68	91.01	83.27	96.76	87.47	76.29	97.52
Abassiya	73.77	64.17	82.58	74.70	65.16	83.60	72.25	63.39	81.03
El Rashad	73.47	62.18	84.65	77.32	67.96	86.46	68.15	56.65	82.76
Abu Jubaiha	42.70	30.90	56.34	50.79	38.38	66.48	33.14	19.06	49.02

TABLE 118: Access to basic education by locality and by state

Location	Access to Basic Education - ALL children			Access to Basic Education – MALES			Access to Basic Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Tadamon	57.42	47.90	67.02	63.23	54.44	72.79	50.64	38.86	62.96
Talodi	65.97	52.36	76.38	65.31	47.36	78.02	65.88	45.76	77.56
Ghadeer	63.33	48.43	77.14	61.09	43.96	78.35	66.48	45.09	79.78
El Leri	70.18	58.20	80.55	76.01	68.43	84.65	62.25	48.57	77.25
Abu Karshola	73.16	64.12	82.11	79.56	69.81	87.47	68.87	58.23	79.12
Delami	84.34	63.84	95.02	85.86	66.30	95.50	81.18	63.80	93.68
South Kordofan State	68.53	54.96	82.10	71.44	58.43	84.45	65.35	50.65	80.05
Abu Zabad	83.63	74.62	89.98	88.15	76.46	93.58	80.18	69.32	88.59
ElKhiwai	76.62	54.95	90.59	79.12	53.70	92.22	74.78	58.75	91.36
Ghubaish	77.19	64.68	86.38	80.35	66.38	90.12	73.79	60.70	83.30
El Nuhud	66.54	54.31	76.81	69.68	59.69	78.56	63.19	50.51	75.85
El Idia	86.78	78.16	93.89	92.17	85.49	96.55	81.87	69.66	90.38
Wad Benda	65.76	55.42	75.99	71.13	60.96	79.73	60.98	48.81	72.59
Lagawa	79.21	64.38	88.13	82.86	68.75	91.73	76.29	59.07	86.80
Elsunut	61.48	40.68	83.07	65.43	41.48	84.02	58.73	33.47	79.98
Keilik	76.44	69.58	81.23	76.17	67.86	83.91	77.04	68.29	84.01
Es Salam	87.48	82.53	92.45	88.76	82.71	93.16	85.71	77.18	92.38
Babanusa	90.57	83.85	94.66	90.59	83.70	94.36	91.41	83.68	96.34
Abyei	71.95	64.44	80.57	63.35	55.98	72.52	81.94	72.79	91.31
El Dibab	74.29	53.29	89.41	75.44	44.71	90.93	74.16	49.24	90.79
El Meiram	76.92	53.63	88.90	78.26	54.53	90.14	74.42	44.71	87.78
West Kordofan State	74.86	62.46	87.26	77.19	65.10	89.27	72.69	59.26	86.11
El Fasher	85.31	81.50	88.19	84.85	80.41	88.02	85.49	81.19	89.02
Tawila	68.78	61.12	75.83	67.22	59.33	73.42	70.97	61.78	79.31
Melit	71.96	62.68	80.04	74.48	65.58	82.07	68.64	57.68	78.16
Um Kadada	85.69	77.63	91.56	86.59	77.89	92.79	84.53	77.06	90.70
Kebkabiya	73.43	58.06	83.70	71.56	54.42	88.63	73.83	59.21	84.40
Kutum	83.77	73.49	91.08	81.25	72.10	90.82	85.36	69.79	94.25
El Mahalha	81.90	74.02	89.14	81.66	71.05	90.91	81.42	72.02	89.45
Saraf Omra	73.15	56.25	85.65	79.71	64.76	90.82	66.67	43.70	83.74
El Serief	53.62	44.31	63.91	66.02	51.21	77.05	46.40	37.50	54.61
Dar Elsalam	62.34	43.89	77.16	64.27	45.37	79.68	62.22	48.80	74.64
Kelemando	78.76	73.50	83.89	79.02	73.06	85.95	77.66	69.42	84.73
El Tawisha	86.99	78.80	92.12	89.85	82.36	94.72	84.66	73.70	91.05
Um Baru	76.14	64.27	85.30	82.94	68.72	92.58	66.67	53.45	80.59
El Lait	91.31	86.24	95.29	90.46	85.10	95.63	91.85	84.60	96.95
ELkuma	90.10	65.59	100.00	93.43	73.17	100.00	90.52	60.22	100.00

TABLE 118: Access to basic education by locality and by state

Location	Access to Basic Education - ALL children			Access to Basic Education – MALES			Access to Basic Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Tina	30.77	0.00	66.67	0.00	0.00	0.00	33.33	0.00	75.00
Kernoi	59.98	54.43	66.20	56.85	46.52	68.29	63.36	55.90	70.55
North Darfur State	75.17	63.56	86.77	75.78	64.45	87.12	74.00	60.90	87.11
Nyala South	94.64	91.62	96.68	93.40	90.14	95.91	95.54	92.10	98.39
Nyala North	94.23	89.18	99.51	97.37	91.34	100.00	90.91	80.51	98.58
Es Salam	73.92	64.98	80.58	72.78	64.34	79.52	74.88	64.57	83.95
El Wihda	67.19	55.75	80.06	61.03	49.98	75.35	75.68	63.10	86.23
Mershing	73.30	65.25	80.66	73.48	65.23	82.25	72.25	61.76	82.96
Beliel	79.14	74.51	83.34	79.93	74.62	83.71	78.08	71.97	83.54
Nitega	83.67	61.54	95.84	86.79	63.39	97.64	82.61	49.89	100.00
Sharg El Jabal (accessible parts)	41.67	24.00	60.04	44.44	20.00	66.75	33.33	9.09	63.79
Kas	50.65	38.24	61.53	54.83	43.63	65.37	46.99	32.99	59.66
Shattaya	30.86	18.01	45.74	36.13	23.18	47.81	26.93	12.58	44.57
Buram	58.78	41.47	71.02	61.41	43.86	75.35	55.25	38.44	69.55
Gereida	86.98	78.09	93.00	88.99	80.91	95.59	83.89	73.45	91.01
El Sunta	48.43	34.14	61.11	54.13	40.28	66.67	41.94	20.60	64.43
El Radoum	52.54	37.09	65.29	57.21	41.26	70.41	46.91	30.37	61.48
Tulus	76.81	50.63	88.96	79.84	61.38	94.52	73.94	35.28	88.41
Damso	54.36	35.49	73.75	58.97	42.33	72.57	51.61	25.55	76.23
Ed Elfursan	72.28	63.72	79.31	68.73	59.75	76.96	75.81	65.20	86.66
Kubum	76.09	67.72	83.53	81.61	75.07	86.06	69.18	55.44	80.32
Kateila	70.60	58.57	80.07	71.98	59.02	83.72	67.67	49.18	80.61
Rehaid Elbirdi	41.55	26.08	56.29	41.69	26.11	57.33	42.43	25.10	60.06
Um Dafoug	14.36	5.55	26.35	16.73	5.81	29.87	11.84	2.68	26.01
South Darfur State	68.81	56.73	80.89	70.62	57.92	83.31	66.43	50.47	82.39
Abu Jabra	63.60	51.76	75.01	67.24	56.29	78.00	59.70	45.60	74.52
Abu Karinka	88.75	79.33	94.59	89.67	77.76	95.05	88.85	76.96	97.00
Bahr El Arab	11.76	0.00	41.73	20.00	0.00	100.00	5.56	0.00	41.20
Adila	79.78	70.67	90.01	82.13	73.74	91.05	78.07	64.97	90.68
Ed Dain	93.37	88.92	96.48	93.99	88.88	97.83	92.75	87.68	96.45
Assalaya	57.87	49.44	65.71	64.47	55.70	73.21	52.11	42.27	61.97
El Firdous	40.46	27.55	52.68	44.34	31.03	56.28	36.14	21.57	50.19
Shia-ria	74.25	63.81	85.12	77.27	66.96	87.73	70.15	56.13	82.65
Yassin	74.08	67.30	79.76	77.81	70.12	84.92	70.56	61.90	77.71
East Darfur State	62.34	50.79	73.89	65.43	39.96	90.90	58.92	44.85	73.00
El Geneina	81.05	71.24	88.99	82.93	71.52	91.21	79.22	65.34	89.30
Habila	43.89	30.67	56.59	54.41	36.94	67.56	33.18	20.52	46.24
Kulbus	77.07	69.73	83.37	82.27	73.57	88.86	72.13	62.29	81.59

TABLE 118: Access to basic education by locality and by state

Location	Access to Basic Education - ALL children			Access to Basic Education – MALES			Access to Basic Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Beida	46.13	23.91	63.73	44.85	23.43	59.84	48.15	24.98	68.62
Foro Baranga	62.55	53.45	70.42	60.00	51.19	70.32	64.45	51.54	75.90
Kereneik	74.78	70.82	78.89	79.29	74.11	83.25	70.69	64.65	75.99
Sirba	54.16	37.04	70.80	61.40	39.43	80.50	45.32	27.72	65.04
Jebel Moon	48.54	30.53	68.16	53.06	34.5	70.55	46.80	26.82	67.24
West Darfur State	66.02	52.90	79.13	69.72	56.16	83.29	62.70	47.69	77.71
Zalingi	66.63	54.78	76.28	65.49	55.43	75.54	66.35	54.25	76.72
Wadi Salih	74.17	59.40	86.41	81.25	67.23	92.04	65.69	45.49	82.86
Mukjar	44.95	18.76	66.06	50.77	26.73	72.95	38.10	13.37	63.30
Central Jebel Mara	90.60	81.75	98.29	88.06	77.50	97.21	93.33	83.01	99.29
North Jebel Mara	57.45	37.02	78.37	52.94	26.90	80.04	61.36	37.43	78.46
Bendasi	55.02	28.87	79.06	66.26	35.19	83.91	40.74	20.37	75.07
Nertiti	80.04	68.49	88.71	83.01	72.11	89.89	78.01	64.63	89.60
Azum	52.69	38.57	61.08	58.71	44.27	67.98	45.45	27.96	58.75
Um Dukhun	36.89	20.25	51.77	38.46	19.23	57.32	35.84	18.84	53.39
Central Darfur State	62.08	45.07	79.10	64.26	46.49	82.03	58.58	40.14	77.02

Spatial distribution of access to basic education

High levels of access to basic education were evenly spread throughout Sudan with very small areas of low access in the following places: parts of Red Sea state; north of Kassala state; and parts of Central and South Darfur states *(see Figure 386)*. This was the same spatial pattern for primary school access for both male and female children *(see Figure 388 and Figure 390)*.

FIGURE 386:
Education: Access to basic education – ALL children (raster)

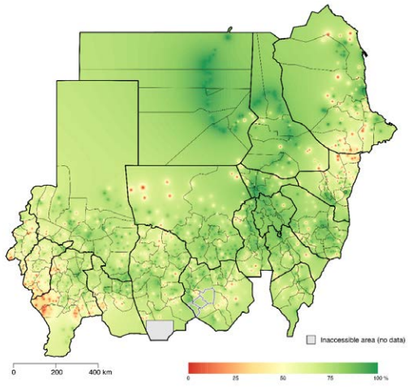


FIGURE 387:
Education: Access to basic education – ALL children

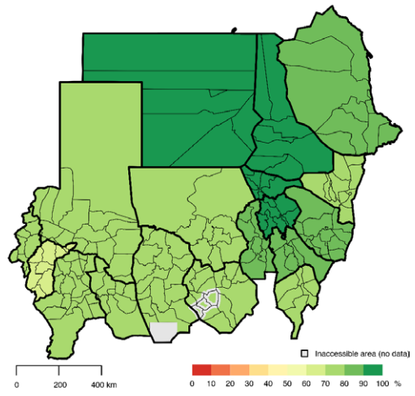


FIGURE 388:
Education: Access to basic education – MALES (raster)

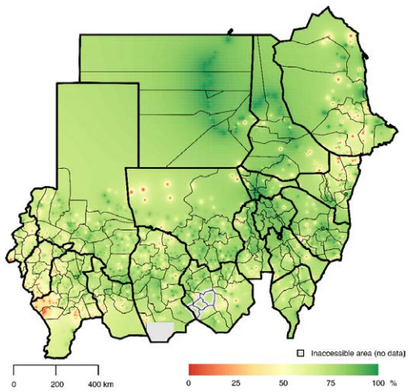


FIGURE 389:
Education: Access to basic education – MALES

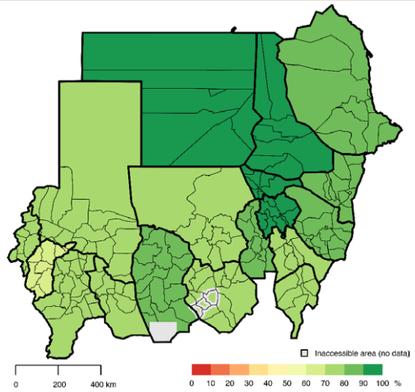


FIGURE 390:
Education: Access to basic education – FEMALES (raster)

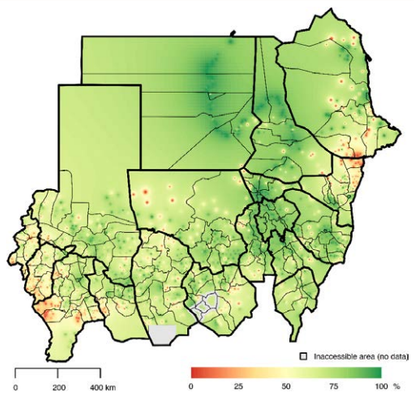
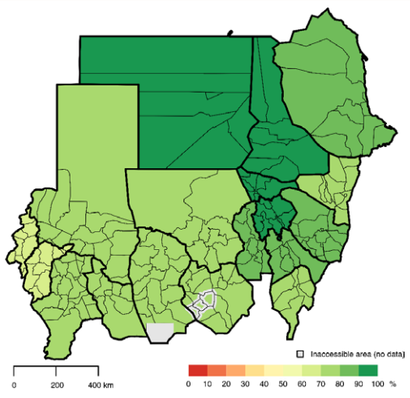


FIGURE 391:
Education: Access to basic education – FEMALES



3.21.3 Access to preschool or basic education

Access to preschool or basic education aggregated average results

The proportion of children with access to either preschool or primary school was 72.3 per cent (95 per cent CI: 62.3-82.3 per cent). The proportion of male children with access to preschool or primary school was 73 per cent (95 per cent CI: 62.7-83.3 per cent), while the access rate for female children was 71.5 per cent (95 per cent CI: 60.5-82.6 per cent). Northern state had the highest proportion of children with access to either preschool or basic school, both for males and females. On the other hand, Central Darfur state had the lowest level of access to either preschool or basic school for all children *(see Figure 392)*. About 76.8 per cent of localities had greater than 50 per cent of children with access to preschool or basic education *(see Figure 393)*.

Table 119 and Table 120 present results by locality, by state and at the national level for access to preschool or basic education.

FIGURE 392: Box plot of state results of access to preschool or basic education

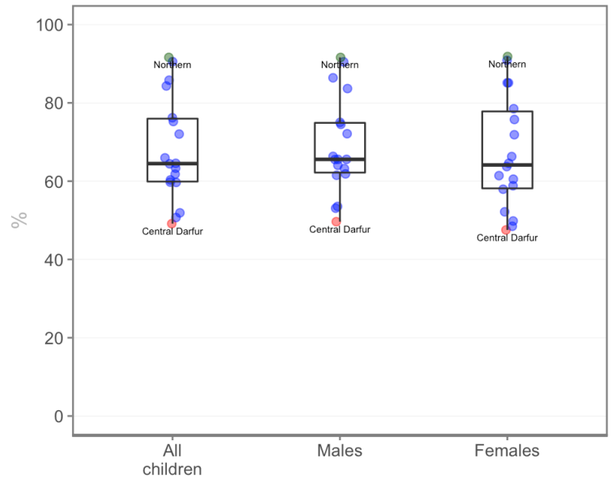


FIGURE 393: Box plot of locality results of access to preschool or basic education

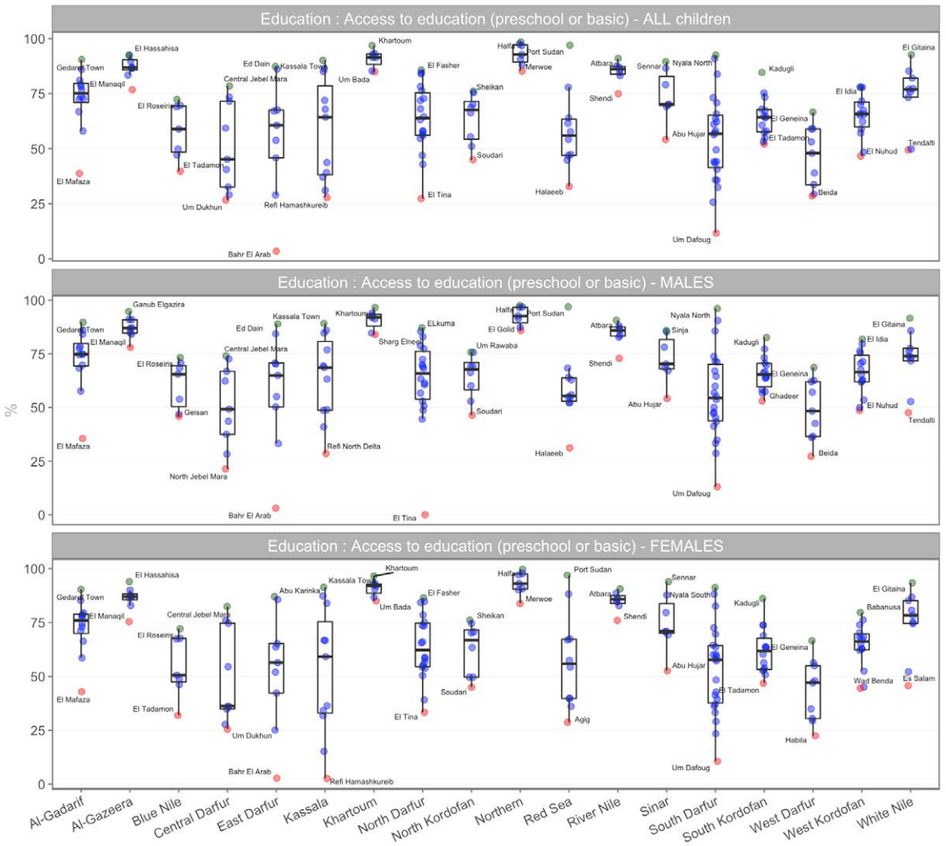


TABLE 119: Access to education (preschool or basic) by state and national

State	Access to (Preschool or Basic) Education – ALL Children			Access to (Preschool or Basic) Education – MALES			Access to (Preschool or Basic) Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	72.03	61.40	82.66	72.12	61.08	83.16	71.86	60.64	83.08
Al-Gazeera	85.80	77.20	94.41	86.40	78.59	94.21	85.12	76.07	94.17
Blue Nile	63.32	53.72	72.92	65.57	54.78	76.36	61.41	49.82	73.01
Central Darfur	49.14	34.02	64.26	49.65	33.49	65.81	47.53	32.56	62.51
East Darfur	51.91	43.00	60.82	53.54	43.91	63.18	49.83	39.43	60.23
Kassala	59.76	49.56	69.95	66.33	55.97	76.70	52.17	39.72	64.62
Khartoum	90.54	84.71	96.36	90.48	84.29	96.67	90.88	84.57	97.19
North Darfur	64.55	53.52	75.58	64.07	53.18	74.95	64.56	52.43	76.69
North Kordofan	64.43	56.27	72.59	65.53	57.03	74.04	63.72	54.60	72.83
Northern	91.62	85.63	97.62	91.61	85.15	98.06	91.84	85.08	98.59
Red Sea	65.96	49.48	82.43	65.57	48.11	83.03	66.29	47.73	84.84
River Nile	84.32	75.27	93.37	83.66	75.09	92.23	85.13	75.79	94.47
Sennar	75.24	65.15	85.34	75.03	64.90	85.16	75.75	64.38	87.12
South Darfur	60.32	48.41	72.22	61.85	49.64	74.06	58.82	45.13	72.50
South Kordofan	59.68	46.74	72.62	61.51	48.57	74.46	57.94	44.24	71.63
West Darfur	50.71	40.49	60.92	53.09	42.48	63.70	48.47	37.62	59.32
West Kordofan	61.79	50.30	73.28	63.21	51.04	75.39	60.51	47.57	73.45
White Nile	76.21	66.48	85.94	74.51	64.51	84.51	78.51	67.84	89.18
Sudan	72.26	62.25	82.28	73.00	62.74	83.27	71.53	60.45	82.61

TABLE 120: Access to education (preschool or basic) by locality and state

Location	Access to (Preschool or Basic) Education – ALL Children			Access to (Preschool or Basic) Education – MALES			Access to (Preschool or Basic) Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	91.32	86.73	95.68	92.29	86.50	96.61	90.96	85.54	95.16
El Golid	88.09	82.54	92.47	85.84	78.38	91.23	90.46	83.90	95.84
Merwoe	85.27	75.88	94.17	86.43	75.68	94.22	83.95	73.09	94.10
El Daba	96.79	92.48	99.52	96.56	90.39	99.42	97.50	92.83	100.00
Halfa	98.83	97.79	99.66	98.48	96.70	99.59	99.45	97.72	100.00
Delgo	96.95	94.29	98.60	96.65	92.84	99.47	97.19	95.01	98.74
El Burgaig	92.29	87.54	96.36	91.87	86.87	96.12	92.55	85.94	97.32

TABLE 120: Access to education (preschool or basic) by locality and state

Location	Access to (Preschool or Basic) Education – ALL Children			Access to (Preschool or Basic) Education – MALES			Access to (Preschool or Basic) Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Northern State	91.62	85.63	97.62	91.61	85.15	98.06	91.84	85.08	98.59
El Matama	81.65	75.73	86.80	82.69	76.10	88.32	80.42	72.93	87.82
Shendi	75.58	59.79	85.31	72.59	60.03	84.26	76.41	63.54	86.28
Abu Hamad	89.86	83.15	94.41	88.57	81.29	94.43	90.81	83.27	95.87
Barbar	85.67	69.89	93.70	86.59	74.99	93.58	83.81	64.89	95.59
El Damar	87.09	80.20	91.88	85.77	79.46	91.05	89.06	82.38	93.52
Atbara	92.80	87.98	96.35	91.70	86.10	95.68	94.08	88.61	97.27
El Buhaira	87.68	81.11	92.73	88.53	83.87	92.51	86.46	78.02	94.15
River Nile State	84.32	75.27	93.37	83.66	75.09	92.23	85.13	75.79	94.47
Khartoum	96.50	93.56	98.44	96.69	93.43	98.80	96.46	93.08	98.92
Bahri	92.70	87.33	95.73	92.19	86.41	96.27	93.19	87.80	96.41
Um Durman	91.48	86.65	94.65	91.40	86.10	95.83	92.04	86.63	95.23
Um Bada	88.12	74.46	94.10	87.07	76.86	93.63	89.78	75.82	96.48
Jebel Awlia	93.65	89.84	97.01	94.52	89.54	98.20	92.46	88.19	96.39
Sharg Elneel	84.04	75.74	90.71	82.60	74.14	90.20	85.54	76.73	93.01
Karrari	89.88	84.66	93.94	90.75	85.30	94.71	89.06	83.13	93.09
Khartoum State	90.54	84.71	96.36	90.48	84.29	96.67	90.88	84.57	97.19
Greater Medani	89.73	83.42	94.84	90.75	84.68	95.64	88.09	81.69	93.98
Ganub Elgazira	91.01	85.34	96.47	92.63	86.14	97.39	90.19	81.08	96.21
El Hassahisa	92.27	89.20	95.18	91.31	87.03	94.88	93.35	89.81	96.18
El Kamlin	86.86	74.75	92.60	86.33	77.33	92.48	86.06	71.39	92.95
Sharg El Gezira	82.80	72.13	91.44	82.85	71.70	92.75	82.09	69.03	90.41
Um Elqura	85.96	79.12	90.90	84.74	77.79	90.84	86.55	78.65	92.27
El Manaqil	76.51	65.25	85.56	78.87	68.28	87.25	74.17	62.25	85.28
El Qurashi	86.65	76.90	92.44	86.77	78.73	92.55	85.89	76.35	93.53
Al-Gazeera State	85.80	77.20	94.41	86.40	78.59	94.21	85.12	76.07	94.17
Sennar	88.76	83.64	92.93	84.86	78.54	89.67	93.01	86.48	96.70
Sharg Sennar	68.50	54.07	80.6	69.00	53.04	81.80	68.22	49.18	83.59
Sinja	87.00	79.80	91.38	86.12	78.79	90.64	87.76	80.61	92.47
Abu Hujar	56.23	43.38	67.17	57.93	43.91	68.23	53.77	39.94	67.54
El Dali	63.38	51.47	75.17	64.26	50.27	76.06	65.27	53.01	76.46
Es Suki	74.81	66.45	83.16	76.01	67.81	83.78	74.44	64.63	84.56
Ed Dinder	69.89	56.57	78.28	72.89	55.82	81.13	67.35	52.59	78.00
Sennar State	75.24	65.15	85.34	75.03	64.90	85.16	75.75	64.38	87.12

TABLE 120: Access to education (preschool or basic) by locality and state

Location	Access to (Preschool or Basic) Education – ALL Children			Access to (Preschool or Basic) Education – MALES			Access to (Preschool or Basic) Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Ed Damazine	78.01	68.59	87.09	77.11	67.57	87.00	78.79	67.48	87.47
El Tadamon	40.16	30.85	49.60	47.44	35.18	58.52	31.97	19.72	47.84
El Roseiris	71.13	62.59	78.26	72.43	61.15	80.60	71.25	62.38	78.09
Baw	48.10	33.73	57.28	52.16	38.69	62.65	44.81	31.69	55.50
Geisan	48.19	35.39	59.73	47.21	32.49	60.16	48.59	35.79	62.36
El Kurmuk	58.78	50.44	66.45	65.71	55.20	75.27	50.00	37.95	60.90
Wad El Mahi	70.29	60.99	79.19	71.92	62.37	80.58	66.95	57.03	77.60
Blue Nile State	63.32	53.72	72.92	65.57	54.78	76.36	61.41	49.82	73.01
Kosti	78.26	71.03	85.42	74.66	66.01	82.97	81.60	72.91	88.70
Guli	87.36	80.84	91.75	86.35	80.78	91.15	88.26	80.45	94.21
Tendalti	58.38	44.51	71.54	56.90	42.24	69.54	61.22	41.23	76.41
Es Salam	47.02	31.81	62.58	50.28	34.62	64.42	44.91	29.00	62.48
Rabak	80.19	70.79	90.47	77.61	66.48	87.58	84.54	74.61	93.44
El Jabalain	73.29	62.41	83.79	72.12	60.65	82.92	74.86	61.65	84.87
El Diwaim	76.35	65.48	85.22	75.35	65.47	84.10	77.11	64.86	86.33
Um Rimta	73.89	60.79	82.02	72.87	59.39	81.22	75.74	60.82	85.51
El Gitaina	88.46	82.09	93.57	86.19	78.29	93.53	91.18	84.51	96.19
White Nile State	76.21	66.48	85.94	74.51	64.51	84.51	78.51	67.84	89.18
Port Sudan	96.01	93.66	97.78	96.17	93.14	98.54	95.94	93.41	98.33
Swakin	44.10	27.32	62.40	51.13	35.58	65.21	39.21	20.85	59.19
El Gonob Welawlaib	56.11	45.38	64.86	55.58	46.19	63.99	56.37	41.86	67.35
Sinkat	62.04	44.13	75.76	54.31	33.33	71.35	68.30	51.67	79.19
Haya	67.74	50.25	82.59	64.74	45.88	80.42	70.47	47.27	85.48
Dordieb	49.06	29.76	64.21	55.26	37.93	71.17	40.87	23.63	60.91
Tokar	57.36	42.36	69.99	58.22	39.26	72.18	57.73	39.05	69.75
Agig	42.18	22.85	58.21	54.74	31.14	71.02	27.27	11.76	46.26
Gabaot Elma-aadin	78.40	70.49	85.34	69.59	57.26	80.64	88.54	79.65	94.61
Halaeeb (accessible parts)	50.31	4.05	72.40	48.57	9.97	71.45	51.85	0.00	75.83
Red Sea State	65.96	49.48	82.43	65.57	48.11	83.03	66.29	47.73	84.84
Kassala Town	90.07	84.77	93.63	89.65	84.33	94.88	90.85	85.25	95.90
Refi Kassla	63.88	54.12	71.57	68.28	58.46	76.98	59.89	49.15	69.41
Rural Western Kassala	37.64	28.95	45.70	41.21	34.23	48.91	32.71	23.22	43.19
New Halfa	85.15	76.69	91.39	84.24	76.66	90.54	86.47	77.42	93.26

TABLE 120: Access to education (preschool or basic) by locality and state

Location	Access to (Preschool or Basic) Education – ALL Children			Access to (Preschool or Basic) Education – MALES			Access to (Preschool or Basic) Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Refi Nahr Atbara	66.44	56.64	74.89	68.53	58.78	78.22	65.17	52.81	76.02
Rural Khashm Elgirba	84.30	78.59	89.88	85.20	78.39	91.44	83.43	76.39	89.48
Rural Wad Elhilaiw	66.74	58.23	74.51	71.22	61.90	78.58	63.52	53.70	72.61
Rural Aroma	32.55	17.26	49.78	35.09	16.96	51.91	29.32	15.52	47.26
Refi North Delta	32.14	14.70	48.26	28.04	12.68	45.90	36.49	16.90	54.22
Refi Hamashkureib	28.22	20.36	34.22	47.74	38.00	57.04	4.01	0.46	10.41
Rural Telkok	40.64	27.30	58.45	63.70	52.37	75.99	15.20	0.00	36.50
Kassala State	59.76	49.56	69.95	66.33	55.97	76.70	52.17	39.72	64.62
Gedaref Town	87.51	80.96	92.80	86.59	79.02	93.44	88.67	82.71	93.58
Middle Geddaref	85.57	72.87	94.70	85.97	70.34	95.53	86.26	71.48	95.26
Elbutana	57.89	50.05	64.48	56.39	48.52	64.18	58.66	48.78	66.16
El Fashaga	73.70	59.86	85.06	74.93	59.93	87.41	72.75	58.75	84.92
El Rahad	63.35	47.17	75.31	62.78	40.90	76.86	62.63	47.19	75.40
Gala-a El Nahal	75.18	63.01	84.43	76.09	66.45	84.43	75.41	61.49	86.45
El Fao	78.55	73.94	83.35	82.43	76.77	86.34	75.09	68.97	80.53
El Qureisha	66.67	56.13	81.14	70.20	60.10	84.22	64.72	52.34	79.40
El Mafaza	43.05	29.13	57.47	40.42	26.07	55.15	46.51	30.72	64.25
Basunda	69.29	57.04	77.70	68.89	54.85	78.81	68.69	57.69	79.70
Western Galabat	76.05	69.43	82.65	74.78	66.80	82.17	78.20	70.67	85.59
Eastern Galabat	77.10	68.81	83.25	77.69	69.71	84.14	76.79	65.19	84.31
Al-Gadarif State	72.03	61.40	82.66	72.12	61.08	83.16	71.86	60.64	83.08
Sheikan	74.05	69.94	77.56	73.73	69.16	78.34	73.99	69.10	78.24
Um Rawaba	71.74	60.39	81.41	72.55	62.83	82.48	71.51	60.82	81.80
Um Dam Haj Ahmed	68.87	61.66	75.41	68.39	59.11	76.09	69.53	60.79	77.79
El Rahad	69.57	61.22	79.04	71.72	64.17	80.99	68.75	56.38	79.70
Bara	65.38	58.23	72.74	63.19	54.91	70.40	67.24	59.01	75.89
Gharb Bara	54.21	47.36	62.51	58.26	48.79	66.05	51.04	43.25	58.42
Soudari	45.10	31.49	56.45	45.93	34.31	55.95	42.70	30.00	54.44
Gebrat El Sheikh	54.03	43.59	63.41	58.54	47.93	66.62	50.25	40.37	59.74
North Kordofan State	64.43	56.27	72.59	65.53	57.03	74.04	63.72	54.60	72.83
Kadugli	84.38	81.16	87.71	82.69	77.83	86.84	85.65	81.71	90.24
Reif Shargi	73.57	63.68	81.71	73.59	64.64	82.04	74.03	62.93	83.14
Dilling	63.06	38.55	80.29	57.63	36.87	73.68	64.03	37.08	88.97

TABLE 120: Access to education (preschool or basic) by locality and state

Location	Access to (Preschool or Basic) Education – ALL Children			Access to (Preschool or Basic) Education – MALES			Access to (Preschool or Basic) Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Quoz	58.29	50.97	63.79	57.74	50.34	63.33	58.35	49.65	65.56
Habila	82.44	72.06	89.43	82.65	73.92	89.67	81.94	68.88	93.07
Abassiya	65.73	54.92	76.56	66.17	54.59	76.51	64.08	54.78	74.67
El Rashad	64.58	53.59	76.90	66.13	53.89	80.01	64.58	53.67	77.67
Abu Jubaiha	35.47	23.14	49.67	42.14	29.23	57.96	28.72	15.23	45.32
El Tadamon	48.32	39.00	56.97	52.60	45.34	62.11	43.29	33.09	54.77
Talodi	58.91	40.65	67.65	57.97	44.25	69.13	57.98	36.76	71.09
Ghadeer	53.62	38.91	68.48	53.07	36.11	70.31	55.08	35.91	68.83
El Leri	61.21	51.96	71.04	67.22	58.12	76.06	55.42	42.37	66.75
Abu Karshola	64.54	55.05	74.95	69.32	58.03	80.12	60.38	51.80	70.18
Delami	76.01	56.28	87.46	77.90	60.22	90.56	74.91	52.94	87.14
South Kordofan State	59.68	46.74	72.62	61.51	48.57	74.46	57.94	44.24	71.63
Abu Zabad	68.42	58.12	77.88	67.25	54.40	77.71	69.32	60.83	77.83
ElKhiwai	62.18	48.45	75.01	62.06	45.83	74.58	61.97	47.69	76.74
Ghubaish	65.67	52.87	76.38	70.35	56.90	80.21	60.70	47.79	69.75
El Nuhud	52.84	44.62	61.72	54.25	44.38	61.77	50.83	39.70	61.20
El Idia	77.65	65.66	87.50	82.00	72.93	90.17	73.30	58.61	86.96
Wad Benda	47.95	40.54	56.10	52.51	45.43	60.84	43.66	35.14	54.23
Lagawa	70.28	55.41	80.66	73.35	58.06	84.01	66.82	53.86	77.33
Elsunut	53.08	31.29	69.12	57.06	36.03	73.34	51.73	28.37	71.54
Keilik	65.44	58.85	70.21	61.96	54.83	68.95	68.12	58.90	74.29
Es Salam	79.06	71.52	85.38	79.83	72.53	86.90	76.90	67.97	84.76
Babanusa	74.69	64.50	81.44	73.17	63.00	80.22	77.20	65.30	85.30
Abyei	57.09	48.42	64.97	49.58	41.53	57.62	65.02	54.59	75.26
El Dibab	50.38	34.25	63.77	51.18	30.16	66.46	52.14	33.33	65.63
El Meiram	64.40	48.46	75.77	62.20	41.73	73.97	66.88	48.08	80.00
West Kordofan State	61.79	50.30	73.28	63.21	51.04	75.39	60.51	47.57	73.45
El Fasher	80.82	76.32	84.86	80.40	75.33	84.39	81.41	76.56	86.05
Tawila	56.01	47.43	64.32	53.22	44.42	62.15	58.28	48.10	69.22
Melit	57.61	46.77	67.98	61.68	51.04	72.97	54.83	42.69	65.75
Um Kadada	78.45	70.52	85.15	78.01	68.43	86.50	78.20	70.28	86.25
Kebkabiya	54.84	45.72	63.94	49.78	38.06	60.53	57.74	45.40	68.75

TABLE 120: Access to education (preschool or basic) by locality and state

Location	Access to (Preschool or Basic) Education – ALL Children			Access to (Preschool or Basic) Education – MALES			Access to (Preschool or Basic) Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kutum	72.00	59.72	80.85	69.31	58.28	77.45	74.91	60.14	86.08
El Mahalha	65.00	55.55	72.84	63.23	52.04	72.19	66.38	54.60	76.72
Saraf Omra	57.65	41.93	71.26	60.98	42.39	74.08	54.82	34.60	70.09
El Serief	43.13	35.54	50.32	48.64	37.08	57.92	39.13	32.57	46.29
Dar Elsalam	56.76	42.42	71.36	56.31	40.17	72.73	56.14	44.82	68.20
Kelemando	67.97	61.00	75.33	70.26	61.36	78.02	66.21	56.87	74.87
El Tawisha	76.20	67.86	82.56	78.45	70.35	86.20	73.84	63.50	81.08
Um Baru	63.06	48.22	73.17	68.98	55.37	78.85	56.52	43.06	69.10
El Lait	84.00	78.36	88.78	83.14	76.82	87.92	85.23	78.58	90.73
ELkuma	84.94	61.06	97.75	86.30	61.80	100.00	83.70	52.01	97.12
El Tina	27.27	6.67	55.56	0.00	0.00	0.00	33.33	8.33	62.56
Kernoi	46.75	40.93	54.20	44.38	36.75	53.47	49.90	40.94	59.77
North Darfur State	64.55	53.52	75.58	64.07	53.18	74.95	64.56	52.43	76.69
Nyala South	90.63	87.96	93.15	90.52	86.88	93.84	91.23	87.13	94.40
Nyala North	92.72	86.51	97.78	96.43	90.15	100.00	87.80	78.87	96.67
Es Salam	62.70	54.49	69.43	60.78	52.34	67.58	64.30	55.61	72.98
El Wihda	56.96	45.59	67.96	54.05	43.65	66.56	59.42	46.95	74.10
Mershing	60.58	52.87	69.07	64.78	55.40	72.23	57.14	44.49	67.52
Beliel	69.95	64.23	74.49	70.12	64.45	75.28	69.37	62.82	76.28
Nitega	65.38	45.15	82.62	66.04	43.19	84.71	62.60	43.51	83.02
Sharg El Jabal (accessible parts)	32.61	17.24	50.06	33.33	15.00	53.02	33.33	8.33	60.13
Kas	40.44	30.45	50.78	44.06	34.29	53.62	36.98	26.02	48.02
Shattaya	26.02	14.85	36.74	28.08	16.67	38.36	23.56	10.97	38.27
Buram	48.98	35.92	60.23	50.67	37.99	63.93	48.87	35.11	62.28
Gereida	84.11	72.35	91.73	85.87	74.62	94.51	82.47	70.16	90.76
El Sunta	36.19	25.37	48.29	41.54	29.40	53.98	28.85	15.46	43.52
El Radoum	44.26	30.26	56.38	47.10	34.21	58.39	40.13	26.45	53.16
Tulus	70.29	45.97	85.30	72.55	51.54	90.58	70.73	44.00	85.68
Damso	44.98	29.16	60.88	47.53	35.06	59.69	42.20	22.14	64.85
Ed Elfursan	57.78	48.61	65.36	55.34	47.30	63.11	59.94	49.21	69.00
Kubum	65.11	54.99	74.33	70.72	63.50	77.74	57.28	46.75	67.16
Kateila	58.10	48.00	68.30	56.70	45.32	67.10	59.86	46.97	71.54
Rehaid Elbirdi	36.33	24.43	51.06	34.80	22.27	48.50	36.23	22.67	51.41
Um Dafoug	11.95	3.13	21.29	12.91	3.51	22.08	10.31	2.27	23.43

TABLE 120: Access to education (preschool or basic) by locality and state

Location	Access to (Preschool or Basic) Education – ALL Children			Access to (Preschool or Basic) Education – MALES			Access to (Preschool or Basic) Education – FEMALES		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Darfur State	60.32	48.41	72.22	61.85	49.64	74.06	58.82	45.13	72.50
Abu Jabra	49.14	38.67	59.52	51.37	41.93	61.23	46.63	34.15	58.85
Abu Karinka	77.13	64.64	86.43	77.58	65.76	84.59	77.47	64.06	89.51
Bahr El Arab	3.3	0.00	8.7	3.08	0.00	15.16	2.86	0.00	10.97
Adila	66.49	56.59	77.52	69.84	57.44	82.08	64.89	53.24	74.70
Ed Dain	87.08	81.30	91.33	87.93	82.35	92.60	86.06	80.81	91.63
Assalaya	45.49	38.94	53.53	50.22	42.28	59.74	42.18	33.41	50.39
El Firdous	29.88	21.22	39.82	34.12	24.46	44.13	26.28	16.58	35.85
Shia-ria	65.14	51.87	77.18	68.25	54.63	79.44	61.50	50.66	73.09
Yassin	63.60	55.34	69.50	65.28	57.97	71.80	61.69	51.08	69.17
East Darfur State	51.91	43.00	60.82	53.54	43.91	63.18	49.83	39.43	60.23
El Geneina	66.77	55.00	75.52	68.24	56.30	77.20	66.52	54.06	75.35
Habila	29.09	18.24	39.33	36.42	22.14	48.75	22.87	12.65	32.15
Kulbus	58.75	50.43	67.23	62.15	53.23	70.55	55.26	45.91	65.67
Beida	28.21	15.48	40.69	27.87	15.17	41.84	29.44	17.01	42.33
Foro Baranga	48.08	39.84	54.82	48.28	40.18	56.28	47.04	36.83	56.01
Kereneik	57.32	52.61	61.20	60.23	55.31	64.66	54.21	48.84	60.11
Sirba	39.24	26.50	49.21	43.95	27.65	55.66	35.54	25.54	46.89
Jebel Moon	33.82	19.75	46.23	36.54	22.56	49.20	30.90	16.50	46.81
West Darfur State	50.71	40.49	60.92	53.09	42.48	63.70	48.47	37.62	59.32
Zalingi	56.48	45.38	66.44	57.48	47.81	67.09	57.44	46.37	68.26
Wadi Salih	59.54	46.78	71.27	63.20	50.70	74.03	54.11	39.17	73.26
Mukjar	32.90	12.92	56.00	38.14	17.02	58.52	28.03	8.61	47.07
Central Jebel Mara	78.86	65.87	91.45	74.43	58.25	89.58	82.97	69.25	94.48
North Jebel Mara	39.30	22.06	53.53	33.96	16.67	52.97	43.09	26.60	57.73
Bendasi	40.72	19.96	58.14	48.77	26.38	67.02	32.41	15.34	52.78
Nertiti	67.31	56.35	77.02	66.67	55.55	76.14	68.18	55.10	78.58
Azum	37.28	28.33	46.24	41.53	31.73	48.72	32.33	19.21	43.02
Um Dukhun	25.38	13.76	37.59	27.27	13.65	42.29	26.42	14.03	40.43
Central Darfur State	49.14	34.02	64.26	49.65	33.49	65.81	47.53	32.56	62.51

Spatial distribution of access to preschool or basic education

The spatial trend for access to preschool or basic education followed the same trend as that for preschool education alone, but with a lesser intensity of low access in the east, south and west of Sudan *(see Figure 394)*. The same spatial pattern was also found for access to preschool or basic education for males and females *(see Figure 396 and Figure 398)*.

FIGURE 394:
Education: Access to education (preschool or basic) – ALL children (raster)

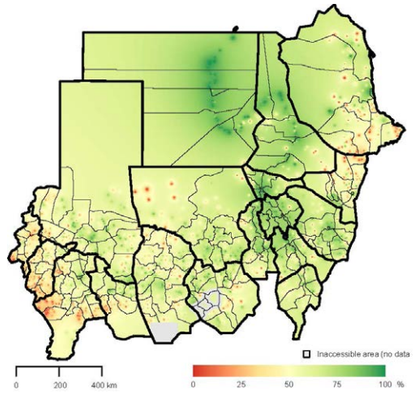


FIGURE 395:
Education: Access to education (preschool or basic) – ALL children

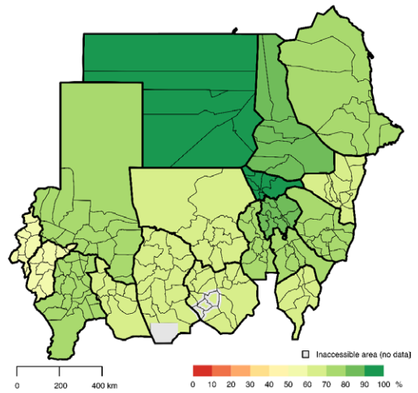


FIGURE 396:
Education: Access to education (preschool or basic) – MALES (raster)

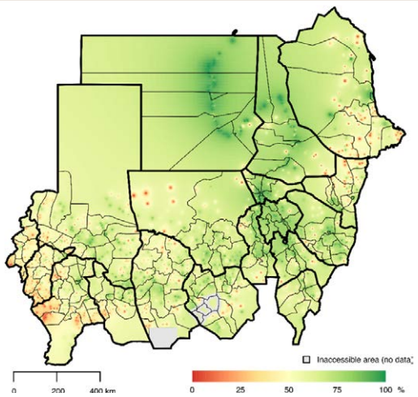


FIGURE 397:
Education: Access to education (preschool or basic) – MALES

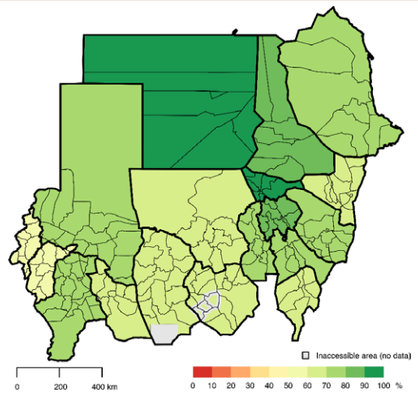


FIGURE 398:
Education: Access to education (preschool or basic) – FEMALES (raster)

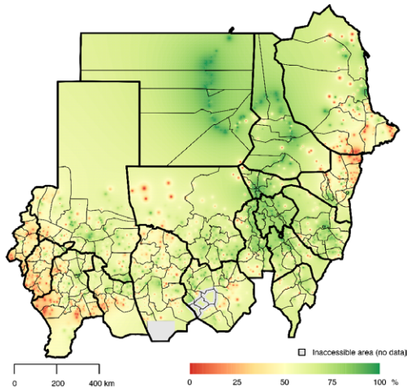
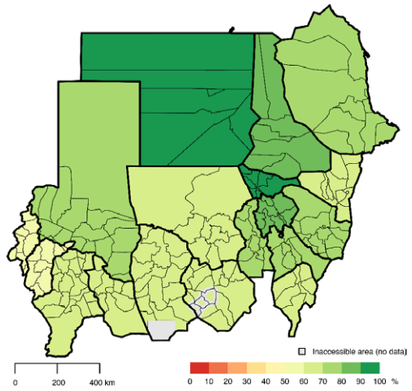


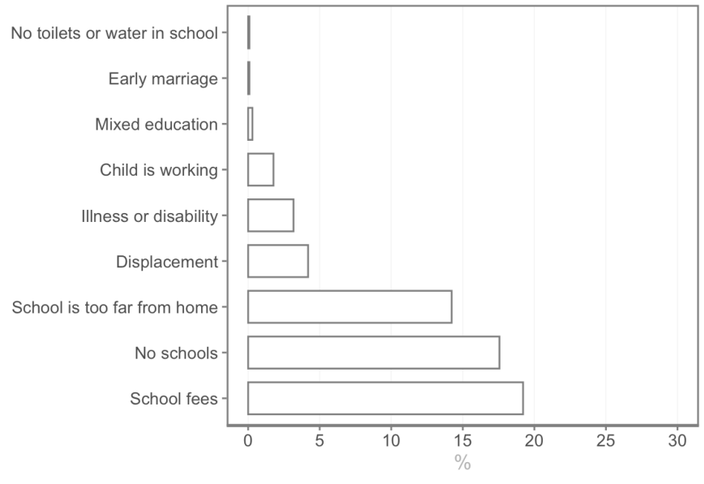
FIGURE 399:
Education: Access to education (preschool or basic) – FEMALES



3.21.4 Reasons for not attending school

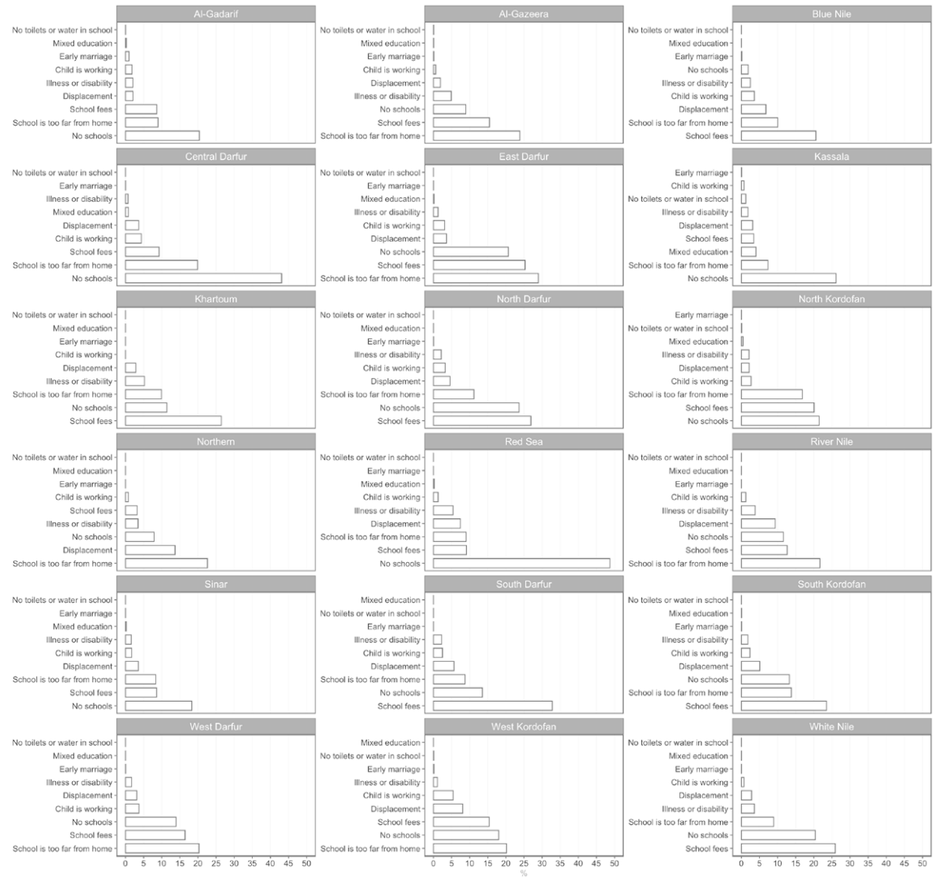
An inability to pay school fees was the primary reason for child non-attendance in school, mentioned by 19.2 per cent (95 per cent CI: 4.6-33.8 per cent) of carers in Sudan. Lack of schools in the area ranked second among reasons for non-attendance, mentioned by 17.6 per cent (95 per cent CI: 0.5-34.6 per cent) of carers. Distance to schools was the third most frequently reported reason for non-attendance, mentioned by 14.2 per cent (95 per cent CI: 0.4-27.9 per cent) of carers. These three reasons combined account for 51 per cent of the total non-attendance in schools in Sudan *(see Figure 400).*

FIGURE 400: Reasons for not attending school – national



The top three reasons for non-attendance in schools reported for the whole country were the same reasons identified in each state, but the relative rankings of each reason varied by state *(see Figure 401).* An inability to pay school fees was reported as the top reason for non-attendance by the highest proportion of carers in nine states, distance to schools was the top reason in four states, and a lack of schools in the area was the top reason in five states.

FIGURE 401: Reasons for not attending school by state



3.21.5 Ever attended school

Respondents ever attended school average results

The proportion of people (among all household members above the age of three years) who had ever attended school was 66.6 per cent (95 per cent CI: 57.4-75.7 per cent) across Sudan. Northern state had the highest proportion of respondents who had ever attended school, while Central Darfur state had the lowest proportion *(see Figure 402).* About 30.8 per cent of localities had fewer than 50 per cent of respondents who had ever attended school *(see Figure 402).*

Table 121 and Table 122 present results by locality, by state and at the national level for respondents who had ever attended school.

FIGURE 402: Box plot of state results of ever attending school

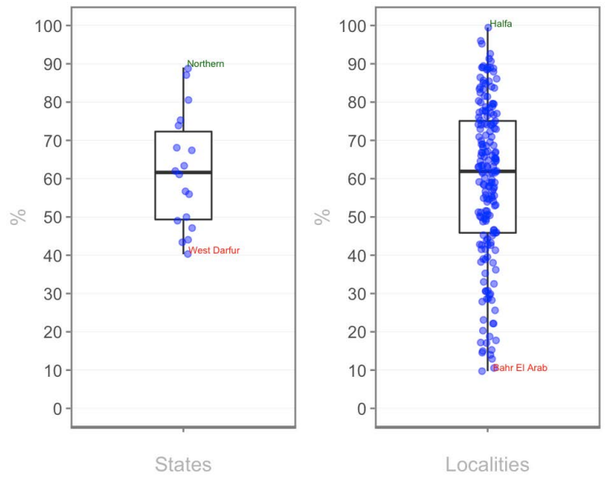


TABLE 121: Ever attended school by state and national

Ever Attended School			
State	**Estimate**	**95% LCL**	**95% UCL**
Al-Gadarif	56.22	46.58	65.87
Al-Gazeera	80.43	70.45	90.42
Blue Nile	50.25	41.38	59.12
Central Darfur	43.16	32.77	53.55
East Darfur	49.03	41.11	56.95
Kassala	47.10	38.81	55.39
Khartoum	86.89	80.48	93.29
North Darfur	61.19	51.69	70.69
North Kordofan	67.15	58.70	75.60
Northern	89.05	83.20	94.90
Red Sea	44.30	31.36	57.24
River Nile	75.55	66.98	84.13
Sennar	68.00	57.90	78.09
South Darfur	56.99	45.82	68.16
South Kordofan	62.07	50.60	73.55
West Darfur	40.26	32.84	47.67
West Kordofan	63.39	54.14	72.64
White Nile	73.73	65.18	82.28
Sudan	66.65	57.48	75.83

TABLE 122: Ever attended school by locality and by state

Ever Attended School			
Location	**Estimate**	**95% LCL**	**95% UCL**
Dongola	85.28	78.54	90.56
El Golid	90.79	86.44	93.85
Merwoe	84.73	74.30	92.82
El Daba	91.41	86.88	94.78
Halfa	98.37	97.00	99.59
Delgo	95.17	92.74	97.09
El Burgaig	93.18	90.16	95.48
Northern State	89.05	83.20	94.90
El Matama	66.61	57.58	76.58
Shendi	67.65	57.17	75.64
Abu Hamad	79.90	70.63	87.07
Barbar	84.11	74.41	90.72
El Damar	76.30	68.63	83.18
Atbara	85.64	78.12	92.65
El Buhaira	83.91	78.04	88.13
River Nile State	75.55	66.98	84.13
Khartoum	95.27	91.92	97.22
Bahri	88.42	81.95	92.80
Um Durman	88.72	82.52	92.96
Um Bada	81.19	68.95	91.20
Jebel Awlia	89.61	83.86	93.79
Sharg Elneel	82.61	74.28	87.49
Karrari	86.44	80.71	90.91
Khartoum State	86.89	80.48	93.29
Greater Medani	84.41	74.17	90.48
Ganub Elgazira	82.40	71.64	90.15
El Hassahisa	86.48	79.07	92.80
El Kamlin	70.93	56.26	83.27
Sharg El Gezira	84.86	74.25	91.50
Um Elqura	78.01	67.82	86.62
El Manaqil	70.92	58.97	82.64
El Qurashi	87.55	79.82	93.49
Al-Gazeera State	80.43	70.45	90.42
Sennar	86.54	79.92	90.82
Sharg Sennar	49.84	38.51	61.94
Sinja	85.78	80.62	90.34
Abu Hujar	47.89	35.35	61.22

TABLE 122: Ever attended school by locality and by state

Ever Attended School			
Location	**Estimate**	**95% LCL**	**95% UCL**
El Dali	54.84	41.14	68.49
Es Suki	67.00	56.45	77.42
Ed Dinder	67.10	56.30	75.06
Sennar State	68.00	57.90	78.09
Ed Damazine	73.00	62.16	82.00
El Tadamon	12.93	9.18	16.63
El Roseiris	58.91	50.04	66.61
Baw	21.15	14.98	26.80
Geisan	51.89	41.60	61.09
El Kurmuk	58.72	51.04	64.48
Wad El Mahi	40.43	29.25	52.83
Blue Nile State	50.25	41.38	59.12
Kosti	75.63	68.96	81.51
Guli	68.53	59.84	75.94
Tendalti	56.18	42.58	68.52
Es Salam	43.70	33.49	55.18
Rabak	78.40	66.71	87.95
El Jabalain	69.50	62.87	76.69
El Diwaim	78.92	70.14	84.74
Um Rimta	77.30	67.75	84.01
El Gitaina	87.30	80.45	93.53
White Nile State	73.73	65.18	82.28
Port Sudan	84.67	77.72	91.19
Swakin	27.22	16.15	40.80
El Gonob Welawlaib	46.55	34.21	59.12
Sinkat	38.36	27.21	49.71
Haya	37.89	21.00	52.69
Dordieb	26.26	14.55	40.50
Tokar	30.75	20.88	39.99
Agig	13.33	8.12	20.27
Gabaot Elma-aadin	55.61	48.53	62.47
Halaeeb (accessible parts)	25.13	3.39	39.60
Red Sea State	44.30	31.36	57.24
Kassala Town	85.24	75.43	91.21
Refi Kassla	48.93	40.74	56.63
Rural Western Kassala	30.81	25.75	35.70
New Halfa	76.20	68.75	82.24

TABLE 122: Ever attended school by locality and by state

Ever Attended School			
Location	**Estimate**	**95% LCL**	**95% UCL**
Refi Nahr Atbara	50.48	41.20	59.70
Rural Khashm Elgirba	76.56	68.89	83.32
Rural Wad Elhilaiw	43.25	32.81	52.43
Rural Aroma	12.18	2.77	25.24
Refi North Delta	43.09	35.09	51.61
Refi Hamashkureib	17.27	10.80	24.10
Rural Telkok	14.47	7.67	22.08
Kassala State	47.10	38.81	55.39
Gedaref Town	78.25	69.40	86.70
Middle Geddaref	75.90	62.91	87.28
Elbutana	50.12	42.44	56.46
El Fashaga	42.89	31.97	52.36
El Rahad	28.83	18.45	40.15
Gala-a El Nahal	58.48	48.45	65.98
El Fao	57.08	48.80	65.79
El Qureisha	57.13	46.46	67.44
El Mafaza	36.92	25.48	48.47
Basunda	61.55	53.55	69.07
Western Galabat	64.38	56.45	71.48
Eastern Galabat	62.43	52.53	72.23
Al-Gadarif State	56.22	46.58	65.87
Sheikan	77.26	72.85	81.48
Um Rawaba	74.52	65.76	83.44
Um Dam Haj Ahmed	73.18	66.54	79.55
El Rahad	66.17	53.89	78.50
Bara	72.04	62.79	79.35
Gharb Bara	59.67	53.21	66.17
Soudari	43.05	31.78	53.70
Gebrat El Sheikh	58.10	50.86	66.01
North Kordofan State	67.15	58.70	75.60
Kadugli	80.01	73.70	84.15
Reif Shargi	74.34	70.16	78.76
Dilling	60.54	32.94	82.95
El Quoz	71.73	64.47	78.03
Habila	77.07	69.68	83.59
Abassiya	74.29	65.49	82.94
El Rashad	61.62	49.31	74.81

TABLE 122: Ever attended school by locality and by state

Ever Attended School			
Location	**Estimate**	**95% LCL**	**95% UCL**
Abu Jubaiha	42.75	35.52	50.29
El Tadamon	47.33	40.31	54.02
Talodi	42.31	29.20	60.98
Ghadeer	57.08	47.01	63.78
El Leri	58.76	51.17	66.79
Abu Karshola	66.89	59.72	71.91
Delami	74.76	66.95	82.03
South Kordofan State	62.07	50.60	73.55
Abu Zabad	73.54	65.98	80.16
ElKhiwai	72.77	60.52	82.81
Ghubaish	76.65	66.13	85.79
El Nuhud	55.45	44.56	65.02
El Idia	78.23	70.37	84.72
Wad Benda	66.40	57.95	74.13
Lagawa	73.21	59.29	81.66
Elsunut	49.26	36.31	61.26
Keilik	57.43	51.67	62.58
Es Salam	69.78	62.51	76.86
Babanusa	67.96	58.77	75.50
Abyei	51.23	44.44	56.88
El Dibab	41.35	28.18	52.11
El Meiram	45.19	36.06	57.19
West Kordofan State	63.39	54.14	72.64
El Fasher	74.22	69.40	78.77
Tawila	65.08	54.39	73.62
Melit	62.51	52.22	71.38
Um Kadada	69.08	59.17	75.99
Kebkabiya	56.08	45.51	63.03
Kutum	64.55	54.79	73.16
El Mahalha	66.35	56.05	74.58
Saraf Omra	37.75	25.29	50.22
El Serief	33.13	26.96	38.21
Dar Elsalam	62.85	52.05	71.07
Kelemando	65.48	58.84	71.07
El Tawisha	78.70	73.00	83.23
Um Baru	55.53	48.60	66.05
El Lait	81.35	74.72	87.92
ELkuma	74.24	54.00	88.76

TABLE 122: Ever attended school by locality and by state

Ever Attended School			
Location	**Estimate**	**95% LCL**	**95% UCL**
El Tina	38.10	17.65	61.54
Kernoi	60.20	56.36	63.30
North Darfur State	61.19	51.69	70.69
Nyala South	81.18	74.80	85.95
Nyala North	65.77	46.23	89.55
Es Salam	58.73	52.05	63.10
El Wihda	50.91	41.25	61.47
Mershing	63.21	54.56	71.77
Beliel	63.16	59.31	67.56
Nitega	65.87	56.10	73.28
Sharg El Jabal (accessible parts)	59.46	43.74	76.67
Kas	45.75	36.40	56.17
Shattaya	37.66	27.20	48.86
Buram	53.94	43.35	62.06
Gereida	72.96	63.80	78.89
El Sunta	64.22	55.35	71.12
El Radoum	51.79	41.64	60.90
Tulus	55.53	40.85	68.08
Damso	48.25	32.30	61.36
Ed Elfursan	57.94	48.87	66.81
Kubum	59.24	50.39	65.51
Kateila	57.82	48.58	66.09
Rehaid Elbirdi	27.85	19.05	38.11
Um Dafoug	15.28	8.30	24.75
South Darfur State	56.99	45.82	68.16
Abu Jabra	49.92	38.30	58.04
Abu Karinka	77.99	69.80	85.40
Bahr El Arab	10.05	3.25	19.05
Adila	65.22	55.52	74.91
Ed Dain	79.59	73.02	85.83
Assalaya	41.56	34.07	47.99
El Firdous	16.97	11.43	23.54
Shia-ria	60.44	51.61	68.51
Yassin	50.00	42.21	57.31
East Darfur State	49.03	41.11	56.95
El Geneina	62.29	52.73	70.28
Habila	15.00	9.56	21.30

TABLE 122: Ever attended school by locality and by state

Location	Ever Attended School		
	Estimate	95% LCL	95% UCL
Kulbus	45.78	37.41	54.24
Beida	31.73	20.62	43.53
Foro Baranga	21.35	16.97	26.27
Kereneik	45.53	39.83	51.31
Sirba	24.00	18.05	29.74
Jebel Moon	22.63	14.29	30.72
West Darfur State	40.26	32.84	47.67
Zalingi	53.66	45.50	61.16
Wadi Salih	45.26	34.64	55.20
Mukjar	22.83	9.08	39.29
Central Jebel Mara	86.27	81.51	90.06
North Jebel Mara	30.99	21.87	40.72
Bendasi	40.85	25.92	52.13
Nertiti	48.01	38.78	55.37
Azum	39.09	27.53	49.14
Um Dukhun	10.28	5.66	15.25
Central Darfur State	43.16	32.77	53.55

3.22 Child protection

3.22.1 Child marriage

Child marriage average results

Child marriage is defined as the marriage of a girl or boy before the age of 18, and it refers to both formal marriages and informal unions in which children under the age of 18 live with a partner as if married. The institution of child marriage affects both girls and boys, but it affects girls disproportionately. Child marriage violates the rights of children and has widespread and long-term consequences for child brides and grooms. The two indicators below are measured for female carers aged 20 – 24 years.

The prevalence of female carers aged 20 – 24 years who married at or before 15 years of age was 26.6 per cent (95 per cent CI: 19.3-33.8 per cent). The prevalence of respondents who married before 18 years of age was much higher at 60.2 per cent (95 per cent CI: 52.1-68.3 per cent), suggesting that many marriages take place between the ages of 15 and 18.

South Darfur had the highest proportion of female carers aged 20 – 24 years who married at or before 15 years of age as well as those who married at or before 18 years of age: 49.2 per cent (95 per cent CI: 40.3-58.2 per cent) and 80.5 per cent (95 per cent CI: 72.9-88.2 per cent), respectively *(see Figure 88)*. Northern and Khartoum states had the lowest proportion of female carers aged 20 – 24 years who got married at or before 15 years of age at 9.9 per cent (95 per cent CI: 5.6-14.3 per cent) and 13.7 per cent (95 per cent CI: 7.8-19.7 per cent), respectively. Northern state had the lowest proportion of carers who married at or before 18 years of age, at 33.2 per cent (95 per cent CI: 26.1-40.4 per cent) *(see Figure 403)*.

Among localities, 75.7 per cent had more than 20 per cent of female carers aged 20 – 24 years who got married at or before 15 years of age, while 99.5 per cent had more than 20 per cent of female carers who got married at or before 18 years of age *(see Figure 404)*.

Table 123 and Table 124 present results per state, per locality and at the national level on early marriages in Sudan.

FIGURE 403: Box plot of state results of early marriage

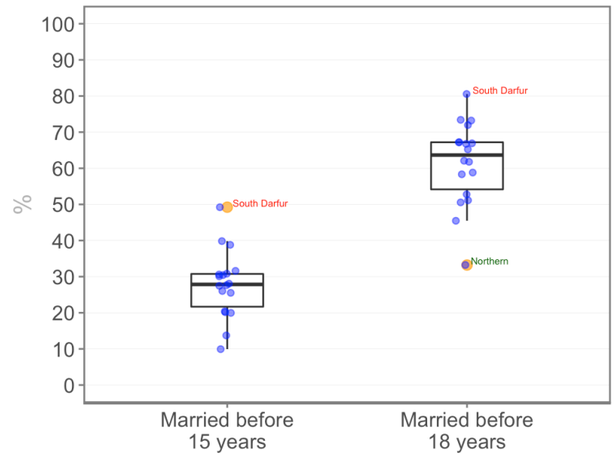


FIGURE 404: Box plot of locality results of early marriage

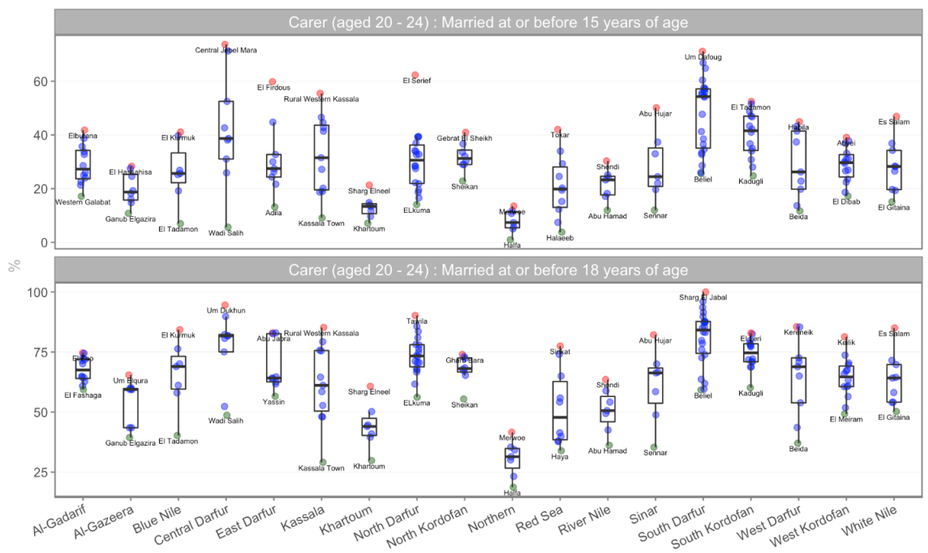


TABLE 123: Early marriage by state and national

State	Married at or before 15 years of age %			Married at or before 18 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	27.66	19.58	35.75	67.21	59.27	75.14
Al-Gazeera	19.98	13.67	26.28	52.78	43.91	61.66
Blue Nile	28.05	22.14	33.96	66.75	59.77	73.73
Central Darfur	39.84	28.84	50.84	73.22	64.65	81.78
East Darfur	30.08	22.84	37.31	67.17	60.36	73.98
Kassala	30.81	24.08	37.55	58.80	50.88	66.72
Khartoum	13.73	7.77	19.69	45.48	36.58	54.39
North Darfur	30.60	21.73	39.48	71.97	62.72	81.22
North Kordofan	31.61	25.12	38.10	66.92	60.59	73.24
Northern	9.94	5.60	14.29	33.22	26.07	40.38
Red Sea	20.17	11.92	28.41	51.14	41.15	61.13
River Nile	20.40	14.71	26.09	50.54	43.60	57.48
Sennar	25.53	18.13	32.93	58.32	50.91	65.73
South Darfur	49.23	40.28	58.18	80.54	72.89	88.19
South Kordofan	38.81	30.54	47.08	73.40	65.40	81.41
West Darfur	26.02	19.31	32.73	62.09	54.37	69.81
West Kordofan	30.43	22.99	37.88	65.22	58.25	72.20
White Nile	27.46	20.79	34.12	61.79	54.08	69.51
Sudan	26.55	19.32	33.78	60.19	52.05	68.33

TABLE 124: Early marriage by locality and state

Location	Married at or before 15 years of age %			Married at or before 18 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	12.00	8.81	15.47	34.06	28.26	40.68
El Golid	7.42	3.82	12.44	30.43	22.89	38.31
Merwoe	13.27	8.27	19.08	41.64	34.98	48.43
El Daba	11.21	6.54	16.71	34.81	26.56	43.13
Halfa	2.07	0.86	3.61	19.03	13.74	23.99
Delgo	5.82	3.57	8.65	31.15	25.15	37.96
El Burgaig	6.10	3.17	9.28	24.35	17.22	31.82
Northern State	9.94	5.60	14.29	33.22	26.07	40.38
El Matama	22.99	15.82	31.57	59.87	49.45	68.55

TABLE 124: Early marriage by locality and state

Location	Married at or before 15 years of age %			Married at or before 18 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Shendi	30.83	23.96	37.46	64.05	56.46	70.94
Abu Hamad	11.47	7.93	15.85	34.95	28.51	41.62
Barbar	22.31	17.47	28.20	52.12	43.99	59.27
El Damar	15.93	12.43	19.88	48.76	44.23	53.67
Atbara	12.67	9.01	17.39	32.63	25.64	40.76
El Buhaira	16.64	12.85	21.16	42.27	37.29	48.89
River Nile State	20.40	14.71	26.09	50.54	43.60	57.48
Khartoum	7.29	3.32	11.72	30.31	24.50	36.46
Bahri	10.24	5.75	17.03	40.85	33.28	50.86
Um Durman	14.51	9.50	21.51	43.76	34.76	53.87
Um Bada	14.26	9.07	20.82	49.41	39.85	59.13
Jebel Awlia	12.83	7.76	19.79	43.82	33.82	51.97
Sharg Elneel	21.85	14.50	30.58	60.83	54.35	67.98
Karrari	12.66	8.30	17.24	42.34	35.41	50.49
Khartoum State	13.73	7.77	19.69	45.48	36.58	54.39
Greater Medani	15.74	11.66	21.53	43.40	35.74	51.15
Ganub Elgazira	11.28	6.44	16.12	40.31	30.16	51.83
El Hassahisa	23.09	15.03	30.41	55.75	44.60	67.25
El Kamlin	14.17	10.16	19.51	43.12	34.01	51.21
Sharg El Gezira	18.07	12.66	25.18	59.47	52.95	66.42
Um Elqura	18.94	13.61	24.18	61.77	52.07	70.08
El Manaqil	24.95	18.23	31.93	55.40	45.83	63.30
El Qurashi	27.56	20.86	33.68	60.51	51.12	69.87
Al-Gazeera State	19.98	13.67	26.28	52.78	43.91	61.66
Sennar	13.43	9.06	19.43	36.63	30.22	43.84
Sharg Sennar	21.11	13.87	29.07	70.00	63.57	76.59
Sinja	19.53	14.38	24.53	48.28	40.69	55.47
Abu Hujar	48.85	38.57	59.27	80.89	73.64	88.11
El Dali	32.89	25.63	41.23	64.98	58.06	72.19
Es Suki	24.75	18.69	32.19	58.95	49.49	66.20
Ed Dinder	38.07	30.92	44.34	68.26	61.54	74.03
Sennar State	25.53	18.13	32.93	58.32	50.91	65.73
Ed Damazine	28.12	22.17	33.56	58.37	49.92	66.07
El Tadamon	7.18	4.22	10.45	39.70	32.26	47.29

TABLE 124: Early marriage by locality and state

Location	Married at or before 15 years of age %			Married at or before 18 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Roseiris	25.95	21.74	31.03	70.06	64.61	74.69
Baw	39.76	33.42	45.68	76.35	71.39	81.50
Geisan	26.46	21.27	31.79	69.58	62.46	76.20
El Kurmuk	41.23	33.31	50.42	84.43	78.00	89.72
Wad El Mahi	21.63	15.26	28.99	64.57	57.68	72.25
Blue Nile State	28.05	22.14	33.96	66.75	59.77	73.73
Kosti	25.11	20.24	30.36	63.25	56.42	71.47
Guli	28.24	22.05	34.30	71.64	66.47	76.85
Tendalti	29.35	20.88	36.46	55.05	47.18	62.47
Es Salam	47.78	41.88	54.14	84.89	78.46	90.27
Rabak	20.08	15.90	25.72	52.92	45.78	59.69
El Jabalain	31.62	23.24	39.77	66.67	59.50	74.35
El Diwaim	34.94	27.99	41.02	64.22	57.34	70.96
Um Rimta	19.92	14.08	25.68	58.35	52.11	65.25
El Gitaina	19.96	13.76	27.30	54.82	46.00	62.89
White Nile State	27.46	20.79	34.12	61.79	54.08	69.51
Port Sudan	19.96	13.31	27.77	47.09	37.19	57.12
Swakin	32.27	22.10	41.47	51.91	43.34	60.28
El Gonob Welawlaib	20.45	10.72	31.71	51.29	41.97	62.27
Sinkat	28.92	21.63	37.22	77.60	71.00	83.39
Haya	8.12	4.01	13.57	35.37	26.86	43.92
Dordieb	22.05	10.98	35.90	63.04	52.70	75.40
Tokar	39.68	31.12	48.49	71.32	60.83	82.27
Agig	19.22	11.06	29.19	37.42	29.12	45.93
Gabaot Elma-aadin	20.35	13.04	29.26	39.61	30.65	47.94
Halaeeb (accessible parts)	8.24	0.00	22.76	49.50	35.99	62.72
Red Sea State	20.17	11.92	28.41	51.14	41.15	61.13
Kassala Town	9.05	5.28	13.21	29.19	22.82	35.02
Refi Kassla	19.62	13.71	26.00	48.50	38.56	57.67
Rural Western Kassala	54.29	48.18	60.92	85.07	79.12	90.49
New Halfa	20.65	16.13	25.35	55.42	47.69	63.10
Refi Nahr Atbara	31.72	25.84	38.03	61.34	55.65	67.83

TABLE 124: Early marriage by locality and state

Location	Married at or before 15 years of age %			Married at or before 18 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Rural Khashm Elgirba	26.49	19.82	33.14	52.49	42.83	61.51
Rural Wad Elhilaiw	41.43	32.70	49.02	77.70	70.68	83.13
Rural Aroma	45.88	37.43	53.90	67.92	59.22	76.38
Refi North Delta	17.44	11.61	23.29	45.28	37.85	52.45
Refi Hamashkureib	43.78	36.34	49.78	74.10	66.67	79.64
Rural Telkok	48.29	36.74	56.97	76.07	65.56	84.72
Kassala State	30.81	24.08	37.55	58.80	50.88	66.72
Gedaref Town	21.63	15.71	27.91	61.15	52.59	69.05
Middle Geddaref	24.67	16.14	35.66	65.16	56.83	73.62
Elbutana	42.96	35.40	52.46	71.85	64.10	79.18
El Fashaga	23.61	15.49	32.45	58.74	51.36	66.99
El Rahad	21.98	17.27	27.43	64.06	55.64	71.63
Gala-a El Nahal	31.86	23.23	41.10	68.38	60.27	77.04
El Fao	36.65	29.62	43.35	74.46	68.62	80.39
El Qureisha	31.17	20.30	43.22	69.34	59.96	77.69
El Mafaza	24.95	17.47	36.00	66.54	57.16	75.63
Basunda	34.88	28.08	43.03	73.06	64.84	79.39
Western Galabat	17.54	12.81	22.68	65.37	56.59	71.91
Eastern Galabat	31.76	24.68	39.27	74.05	67.29	80.60
Al-Gadarif State	27.66	19.58	35.75	67.21	59.27	75.14
Sheikan	25.59	20.85	30.58	58.38	52.24	64.42
Um Rawaba	32.16	25.86	37.85	66.38	61.04	71.12
Um Dam Haj Ahmed	32.12	24.79	40.77	70.85	63.40	77.34
El Rahad	30.25	23.09	38.11	68.07	62.30	74.19
Bara	29.31	21.79	37.50	73.47	66.02	79.71
Gharb Bara	32.34	26.45	38.10	72.86	68.18	78.31
Soudari	38.10	30.61	46.09	69.12	61.49	75.93
Gebrat El Sheikh	41.18	33.61	49.91	73.52	65.68	80.66
North Kordofan State	31.61	25.12	38.10	66.92	60.59	73.24
Kadugli	24.24	19.87	28.79	60.27	53.35	66.75
Reif Shargi	28.45	21.18	36.40	70.53	60.70	78.06
Dilling	29.80	20.83	38.99	64.20	49.79	75.71
El Quoz	36.05	29.76	43.08	77.35	71.45	82.07

TABLE 124: Early marriage by locality and state

Location	Married at or before 15 years of age %			Married at or before 18 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Habila	35.44	29.06	43.29	70.65	65.42	76.41
Abassiya	40.16	31.25	49.41	70.83	62.97	76.96
El Rashad	34.78	27.82	42.65	69.16	60.70	77.65
Abu Jubaiha	53.40	46.01	60.79	82.73	76.51	87.92
El Tadamon	46.92	38.24	55.84	78.53	73.35	84.27
Talodi	43.06	30.20	52.50	82.27	63.77	89.44
Ghadeer	51.64	39.11	60.07	78.79	65.54	87.54
El Leri	46.90	40.71	54.15	83.26	78.17	86.82
Abu Karshola	31.55	24.67	38.18	71.19	66.25	75.68
Delami	34.66	23.53	46.26	71.14	63.20	80.28
South Kordofan State	38.81	30.54	47.08	73.40	65.40	81.41
Abu Zabad	23.08	18.73	29.70	62.16	55.01	68.42
ElKhiwai	23.85	17.49	31.48	56.90	48.63	65.64
Ghubaish	32.91	27.06	40.56	65.11	57.49	73.39
El Nuhud	34.06	26.84	42.11	69.49	63.13	74.55
El Idia	26.98	22.21	33.02	60.74	54.08	66.67
Wad Benda	29.18	22.97	36.85	66.85	59.51	72.87
Lagawa	37.23	30.95	44.37	73.67	68.11	79.40
Elsunut	32.25	25.47	39.74	70.52	65.25	76.26
Keilik	38.35	31.73	45.52	81.36	76.88	85.65
Es Salam	29.74	25.05	35.45	62.81	56.86	69.24
Babanusa	27.78	23.40	32.52	61.74	55.76	66.98
Abyei	39.04	33.16	45.83	67.25	59.34	74.41
El Dibab	25.91	15.98	39.39	60.00	47.59	74.14
El Meiram	17.79	11.67	26.72	48.50	40.71	58.39
West Kordofan State	30.43	22.99	37.88	65.22	58.25	72.20
El Fasher	25.28	20.45	30.50	60.71	54.01	66.07
Tawila	28.00	22.37	34.47	90.91	86.34	94.17
Melit	33.06	26.92	39.06	81.29	74.52	87.95
Um Kadada	18.42	14.36	22.27	61.80	57.22	65.84
Kebkabiya	16.59	12.09	21.68	73.70	67.86	79.36
Kutum	37.38	26.63	48.73	69.98	60.20	77.47
El Mahalha	19.23	13.58	24.74	75.70	65.91	83.55

TABLE 124: Early marriage by locality and state

Location	Married at or before 15 years of age %			Married at or before 18 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Saraf Omra	40.08	31.93	49.12	75.53	68.88	81.00
El Serief	59.18	53.11	64.41	83.21	79.22	86.90
Dar Elsalam	40.80	35.33	46.51	79.43	73.66	84.57
Kelemando	29.91	24.85	37.15	79.38	74.54	83.95
El Tawisha	32.58	28.07	36.77	68.37	64.05	73.31
Um Baru	35.80	26.44	43.34	74.85	63.57	83.34
El Lait	27.27	21.56	33.48	74.40	67.41	81.60
ELkuma	15.00	7.66	26.07	57.64	41.93	71.55
El Tina	22.22	0.00	55.56	66.67	33.33	88.89
Kernoi	39.18	32.07	47.57	81.43	75.54	86.82
North Darfur State	30.60	21.73	39.48	71.97	62.72	81.22
Nyala South	26.01	20.84	32.47	62.86	56.37	69.50
Nyala North	34.51	17.39	48.85	64.34	45.90	78.77
Es Salam	57.05	50.08	63.71	88.85	83.49	93.49
El Wihda	33.73	27.60	40.20	71.98	65.90	77.73
Mershing	36.63	29.90	44.71	74.05	69.38	79.03
Beliel	25.28	22.26	29.60	59.45	55.25	63.71
Nitega	38.90	31.10	45.50	76.57	70.05	82.27
Sharg El Jabal (accessible parts)	33.33	13.33	53.67	100.00	100.00	100.00
Kas	54.38	45.00	63.57	87.41	82.20	92.23
Shattaya	68.33	61.00	75.58	93.07	88.72	96.04
Buram	67.22	61.15	73.07	89.93	86.02	94.14
Gereida	41.45	33.93	49.00	78.81	71.96	84.17
El Sunta	56.65	49.43	63.64	85.55	80.95	89.77
El Radoum	61.54	54.75	67.46	87.96	83.20	92.12
Tulus	56.85	44.49	72.01	83.33	73.60	94.64
Damso	53.82	46.44	63.61	83.10	77.51	88.14
Ed Elfursan	54.06	44.13	63.55	87.55	81.71	93.58
Kubum	56.80	50.00	65.45	87.71	84.08	90.86
Kateila	48.17	39.43	56.30	79.87	71.23	87.26
Rehaid Elbirdi	57.97	48.06	68.06	86.36	80.18	91.64
Um Dafoug	71.14	64.19	77.36	96.01	92.99	98.75
South Darfur State	49.23	40.28	58.18	80.54	72.89	88.19

TABLE 124: Early marriage by locality and state

Location	Married at or before 15 years of age %			Married at or before 18 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Abu Jabra	49.14	38.36	59.59	82.06	74.94	88.01
Abu Karinka	27.37	21.92	33.00	57.24	49.26	63.79
Bahr El Arab	26.03	18.86	35.46	63.95	56.34	70.74
Adila	13.04	7.97	20.56	61.81	54.70	68.40
Ed Dain	29.14	22.43	36.94	59.78	53.20	66.63
Assalaya	32.89	27.29	38.44	82.87	76.51	87.46
El Firdous	54.16	46.05	62.95	78.38	71.01	84.55
Shia-ria	25.60	19.75	32.18	66.34	58.85	73.40
Yassin	22.53	16.12	28.50	57.59	52.04	62.73
East Darfur State	30.08	22.84	37.31	67.17	60.36	73.98
El Geneina	23.83	18.14	28.82	61.61	55.22	67.89
Habila	41.14	33.40	49.30	69.11	59.88	77.06
Kulbus	23.13	16.27	31.04	70.71	60.19	79.22
Beida	12.09	6.78	17.75	39.17	30.21	48.24
Foro Baranga	40.75	33.75	49.75	70.61	63.35	78.90
Kereneik	42.22	37.35	46.47	84.92	81.78	87.58
Sirba	16.48	10.04	24.27	43.89	34.37	54.22
Jebel Moon	15.14	7.76	24.64	54.20	45.40	64.08
West Darfur State	26.02	19.31	32.73	62.09	54.37	69.81
Zalingi	32.23	26.77	38.09	66.35	59.56	72.69
Wadi Salih	5.92	3.15	9.43	48.50	42.98	53.97
Mukjar	26.22	17.51	33.88	52.43	45.32	60.04
Central Jebel Mara	74.13	59.56	86.60	89.31	78.84	97.87
North Jebel Mara	26.57	9.93	49.66	81.12	60.96	96.11
Bendasi	53.41	44.69	61.29	81.19	73.83	87.78
Nertiti	41.19	34.18	48.50	84.54	79.20	89.42
Azum	40.15	33.33	46.65	82.86	75.90	87.54
Um Dukhun	69.81	61.94	77.68	94.00	90.67	96.17
Central Darfur State	39.84	28.84	50.84	73.22	64.65	81.78

Spatial distribution of early child marriage rates

There was an increasing trend of marriage at or before 15 years of age from the east to the west and southwest of Sudan with the highest prevalence in areas of South Darfur state. This increasing trend continued and intensified for marriage at or before 18 years of age *(see Figure 405 and Figure 407).*

FIGURE 405:
Carer (aged 20 - 24): Married at or before 15 years of age (raster)

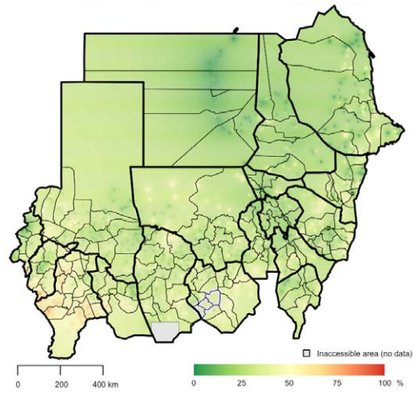


FIGURE 406:
Carer (aged 20 - 24): Married at or before 15 years of age

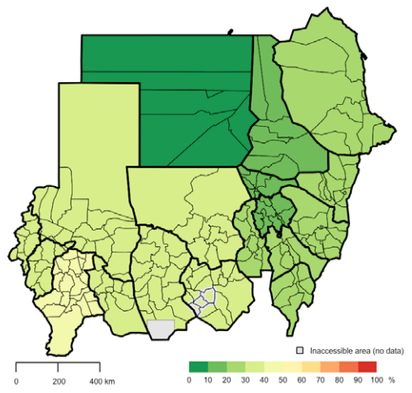


FIGURE 407:
Carer (aged 20 - 24): Married at or before 18 years of age (raster)

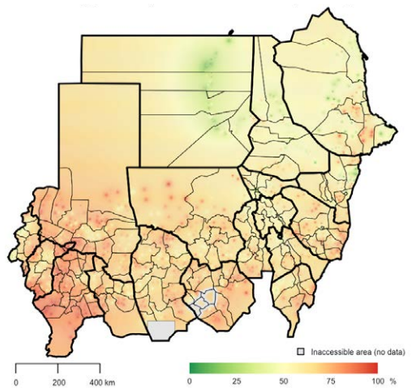
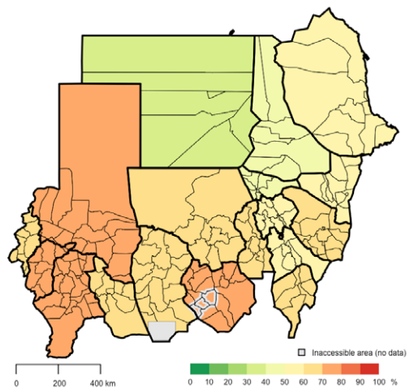


FIGURE 408:
Carer (aged 20 - 24): Married at or before 18 years of age



3.22.2 Early parity

Early parity average results

Early parity is defined as birth before the age of 19. The prevalence of women carers aged 20-24 years at the time of the survey who gave birth between 15 and 19 years old was 72 per cent (95 per cent CI: 59.3-84.7 per cent). The average age at first parity for surveyed women of carers aged 20-24 was 19.4 years (95 per cent CI: 18.7-20.1 years).

Blue Nile state had the highest levels of early parity among the women surveyed aged 20-24 years who had given birth between 15 to 19 years of age; specifically, the percentage in Blue Nile was 80.1 (95 per cent CI: 68.1-92.1 per cent). By contrast, the proportions were significantly lower in River Nile, Red Sea and Northern states; the percentage of carers there aged 20-24 years who gave birth between 15-19 years of age was: 65.4 per cent (95 per cent CI: 46.7-76.12 per cent); 62.7per cent (95 per cent CI: 46.1-79.3per cent); and 61.4 per cent (95 per cent CI: 46.7-76.1 per cent) respectively. Northern state had the oldest average age at first parity at 21.7 years (95 per cent CI: 21-22.4), while South Darfur state had the youngest age at first parity at 17.6 years (95 per cent CI: 17-18.2) *(see Figure 409).*

Among localities, 94.1 per cent had more than 60 per cent of surveyed women carers aged 20-24 years who had given birth when they were between 15 to 19 years of age. The mean age of first parity was less than 18 years in 27.6 per cent of localities.

Table 125 and Table 126 present per state, per locality and national level results of early parity in Sudan.

FIGURE 409: Box plot of state results of early parity

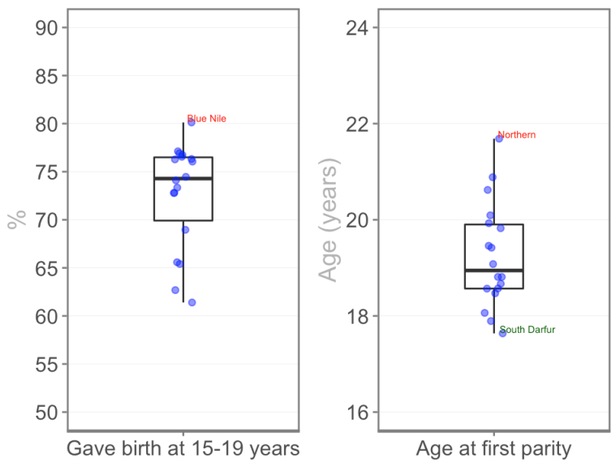


TABLE 125: Early parity by state and national

State	Giving Birth between 15 and 19 years of age %			Age at First Parity (years)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	77.13	67.10	87.17	18.57	17.88	19.27
Al-Gazeera	68.96	55.49	82.42	19.93	19.20	20.65
Blue Nile	80.12	68.14	92.10	18.57	18.04	19.10
Central Darfur	74.10	54.83	93.37	18.06	17.47	18.66
East Darfur	76.92	65.65	88.19	18.81	18.23	19.39
Kassala	72.80	61.93	83.67	19.82	19.19	20.46
Khartoum	65.58	51.07	80.08	20.89	20.00	21.77
North Darfur	76.75	65.66	87.83	18.47	17.84	19.10
North Kordofan	76.06	66.32	85.80	18.81	18.34	19.29
Northern	61.40	46.74	76.06	21.69	21.00	22.37
Red Sea	62.68	46.11	79.25	20.62	19.66	21.58
River Nile	65.40	55.30	75.50	20.09	19.42	20.77
Sennar	72.78	61.87	83.70	19.42	18.78	20.05
South Darfur	76.55	62.63	90.47	17.64	17.03	18.24

TABLE 125: Early parity by state and national

State	Giving Birth between 15 and 19 years of age %			Age at First Parity (years)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Kordofan	74.47	63.51	85.42	17.89	17.29	18.50
West Darfur	73.34	62.95	83.74	19.46	18.81	20.11
West Kordofan	76.28	64.46	88.09	18.67	18.04	19.30
White Nile	76.33	66.66	86.00	19.08	18.41	19.74
Sudan	72.01	59.32	84.69	19.40	18.70	20.10

TABLE 126: Early parity by locality

Location	Giving Birth between 15 and 19 years of age %			Age at First Parity (years)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	66.67	52.92	80.02	21.78	20.97	22.53
El Golid	52.73	37.21	66.98	21.92	21.21	22.60
Merwoe	56.44	44.15	68.76	21.01	20.45	21.67
El Daba	67.14	51.66	79.22	21.44	20.65	22.21
Halfa	63.51	45.75	79.70	22.22	21.80	22.67
Delgo	61.97	48.86	76.05	21.87	21.18	22.55
El Burgaig	56.12	41.04	70.78	22.59	21.97	23.25
Northern State	61.40	46.74	76.06	21.69	21.00	22.37
El Matama	72.06	61.76	81.15	19.33	18.39	20.46
Shendi	65.56	56.75	74.31	18.90	18.32	19.52
Abu Hamad	64.37	51.41	79.28	21.36	20.76	21.84
Barbar	68.82	57.01	80.92	20.27	19.56	21.08
El Damar	63.68	55.32	71.18	20.16	19.75	20.63
Atbara	60.53	45.86	72.69	21.64	20.97	22.23
El Buhaira	65.45	55.14	75.17	20.52	19.98	21.06
River Nile State	65.71	61.46	69.53	20.36	20.04	20.64
Khartoum	62.50	42.69	77.25	22.43	21.73	23.10
Bahri	66.67	55.77	78.83	21.38	20.61	22.16
Um Durman	71.79	59.42	82.96	20.78	19.91	21.69
Um Bada	62.65	48.64	74.73	20.60	19.95	21.47
Jebel Awlia	61.96	45.45	76.02	21.04	20.01	22.03
Sharg Elneel	62.28	49.03	74.76	19.69	19.04	20.32
Karrari	73.39	58.14	86.14	20.89	20.14	21.60

TABLE 126: Early parity by locality

Location	Giving Birth between 15 and 19 years of age %			Age at First Parity (years)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Khartoum State	65.58	51.07	80.08	20.89	20.00	21.77
Greater Medani	73.87	63.00	84.15	21.07	20.39	21.82
Ganub Elgazira	59.70	42.85	75.02	20.78	20.04	21.54
El Hassahisa	71.57	57.28	83.97	19.41	18.63	20.30
El Kamlin	75.00	62.46	87.78	20.94	20.14	21.70
Sharg El Gezira	70.93	58.82	83.00	19.38	18.83	19.99
Um Elqura	80.95	68.36	91.18	19.52	18.91	20.26
El Manaqil	64.91	52.53	77.52	19.39	18.71	20.15
El Qurashi	66.67	48.10	81.09	19.45	18.72	20.15
Al-Gazeera State	68.96	55.49	82.42	19.93	19.20	20.65
Sennar	64.08	48.88	77.29	21.60	20.88	22.31
Sharg Sennar	77.24	65.22	85.72	18.46	18.08	18.91
Sinja	79.17	66.01	87.63	20.18	19.50	20.94
Abu Hujar	82.35	71.62	91.69	17.78	17.25	18.50
El Dali	77.31	66.38	88.50	18.47	18.01	18.97
Es Suki	71.17	59.83	82.86	19.16	18.47	19.83
Ed Dinder	70.69	61.10	79.83	18.30	17.80	18.83
Sennar State	72.78	61.87	83.70	19.42	18.78	20.05
Ed Damazine	80.20	67.51	90.53	19.47	18.79	20.21
El Tadamon	71.95	58.39	84.70	19.95	19.41	20.51
El Roseiris	75.31	65.98	83.94	18.48	18.06	18.87
Baw	94.12	78.08	100.00	17.56	17.17	18.05
Geisan	85.29	73.52	94.94	18.20	17.79	18.64
El Kurmuk	86.11	72.00	95.65	17.32	16.87	17.70
Wad El Mahi	71.13	57.49	82.21	18.68	18.13	19.18
Blue Nile State	80.12	68.14	92.10	18.57	18.04	19.10
Kosti	77.40	66.87	86.02	18.89	18.22	19.56
Guli	74.29	61.14	84.66	18.70	18.24	19.26
Tendalti	72.63	59.80	84.32	19.46	18.87	20.07
Es Salam	88.50	80.43	94.70	17.44	17.00	17.92
Rabak	69.13	61.64	77.43	19.84	19.19	20.48
El Jabalain	80.00	71.05	89.01	18.94	18.39	19.47
El Diwaim	83.01	73.38	90.32	18.68	18.08	19.34
Um Rimta	63.57	54.76	73.04	19.96	19.26	20.55
El Gitaina	74.63	63.85	85.37	19.50	18.87	20.21
White Nile State	76.33	66.66	86.00	19.08	18.41	19.74
Port Sudan	66.13	50.00	79.77	21.01	20.07	21.92

TABLE 126: Early parity by locality

Location	Giving Birth between 15 and 19 years of age %			Age at First Parity (years)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Swakin	75.31	61.05	86.62	20.02	18.98	21.16
El Gonob Welawlaib	91.14	78.94	98.59	20.90	19.44	22.38
Sinkat	68.10	56.29	79.72	19.32	18.75	19.88
Haya	41.67	27.37	55.31	21.43	20.50	22.59
Dordieb	75.00	62.06	86.34	19.28	18.44	20.26
Tokar	67.16	55.88	77.66	19.63	18.95	20.43
Agig	68.89	41.22	88.11	22.64	21.54	23.73
Gabaot Elma-aadin	64.71	44.10	88.01	20.39	19.80	21.08
Halaeeb (accessible parts)	53.33	27.70	83.33	20.35	19.67	21.23
Red Sea State	62.68	46.11	79.25	20.62	19.66	21.58
Kassala Town	58.06	43.73	70.30	22.37	21.78	23.05
Refi Kassla	81.48	69.70	93.44	21.43	20.56	22.44
Rural Western Kassala	77.90	70.02	87.14	17.59	17.22	18.03
New Halfa	66.88	55.83	75.91	19.84	19.24	20.46
Refi Nahr Atbara	75.21	65.71	83.81	19.75	19.18	20.30
Rural Khashm Elgirba	70.24	57.13	82.11	19.30	18.50	20.22
Rural Wad Elhilaiw	76.42	63.69	86.62	17.79	17.40	18.22
Rural Aroma	71.19	57.11	81.71	18.70	18.15	19.25
Refi North Delta	53.54	41.02	66.68	20.81	20.22	21.30
Refi Hamashkureib	83.61	73.01	92.86	18.47	18.12	18.89
Rural Telkok	82.88	72.80	90.39	18.83	18.20	19.79
Kassala State	72.80	61.93	83.67	19.82	19.19	20.46
Gedaref Town	69.23	61.47	77.40	19.26	18.45	20.31
Middle Geddaref	81.36	70.08	90.74	19.16	18.20	19.97
Elbutana	64.52	48.93	79.42	18.24	17.72	18.86
El Fashaga	68.42	55.68	78.36	19.24	18.50	19.94
El Rahad	81.58	71.96	89.81	18.60	17.96	19.36
Gala-a El Nahal	85.71	76.10	92.80	17.97	17.39	18.53
El Fao	73.04	60.92	83.89	17.96	17.49	18.56
El Qureisha	78.29	66.12	88.91	18.52	17.81	19.17
El Mafaza	87.37	77.08	94.07	18.36	17.81	18.99
Basunda	76.92	65.15	85.95	18.05	17.49	18.74
Western Galabat	74.17	61.67	84.51	18.95	18.43	19.40
Eastern Galabat	86.49	74.32	94.63	17.89	17.53	18.32
Al-Gadarif State	77.13	67.10	87.17	18.57	17.88	19.27

TABLE 126: Early parity by locality

Location	Giving Birth between 15 and 19 years of age %			Age at First Parity (years)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sheikan	71.07	63.04	77.85	19.40	19.00	19.80
Um Rawaba	78.53	69.64	85.88	18.76	18.31	19.18
Um Dam Haj Ahmed	81.32	69.23	91.77	18.45	17.94	19.01
El Rahad	86.67	72.00	96.97	18.56	18.13	19.07
Bara	75.94	64.43	87.34	18.76	18.30	19.26
Gharb Bara	83.08	73.21	91.68	18.62	18.22	19.12
Soudari	70.27	60.69	80.83	18.58	18.08	19.13
Gebrat El Sheikh	77.31	66.37	87.73	18.30	17.79	18.92
North Kordofan State	76.06	66.32	85.80	18.81	18.34	19.29
Kadugli	70.27	60.95	79.62	19.26	18.69	19.80
Reif Shargi	72.92	62.09	82.31	18.16	17.60	18.95
Dilling	69.81	53.33	86.07	18.93	18.01	20.00
El Quoz	71.11	62.82	78.86	17.51	17.13	17.85
Habila	72.73	62.50	81.61	18.14	17.71	18.63
Abassiya	76.53	64.21	86.84	17.83	17.18	18.45
El Rashad	82.61	66.31	92.72	18.20	17.67	18.86
Abu Jubaiha	77.70	68.62	85.61	17.20	16.63	17.77
El Tadamon	80.25	71.56	87.07	17.40	16.91	17.87
Talodi	82.05	68.87	92.50	17.00	16.59	18.09
Ghadeer	68.66	56.06	82.77	17.50	16.80	18.60
El Leri	80.36	69.89	88.50	17.18	16.83	17.61
Abu Karshola	70.08	60.65	79.07	17.83	17.49	18.22
Delami	76.00	60.27	90.94	17.81	17.13	18.47
South Kordofan State	74.47	63.51	85.42	17.89	17.29	18.50
Abu Zabad	75.70	63.15	85.71	19.07	18.47	19.60
ElKhiwai	67.46	51.88	81.82	19.16	18.46	19.75
Ghubaish	79.09	69.54	88.57	18.17	17.60	18.77
El Nuhud	74.71	63.19	84.98	18.16	17.62	18.72
El Idia	77.12	61.88	92.13	19.05	18.53	19.63
Wad Benda	71.77	60.71	82.27	18.54	18.05	19.00
Lagawa	90.83	83.10	97.15	18.06	17.63	18.62
Elsunut	86.44	79.78	93.20	18.38	17.95	18.74
Keilik	78.00	69.28	85.38	17.61	17.20	18.00
Es Salam	70.43	62.56	79.90	19.01	18.44	19.58
Babanusa	71.84	62.75	81.48	19.18	18.63	19.66
Abyei	78.79	65.68	87.03	18.79	18.00	19.71

TABLE 126: Early parity by locality

Location	Giving Birth between 15 and 19 years of age %			Age at First Parity (years)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
El Dibab	96.55	83.84	100.00	19.89	18.41	21.57
El Meiram	52.63	29.41	75.06	19.87	19.30	20.57
West Kordofan State	76.28	64.46	88.09	18.67	18.04	19.30
El Fasher	72.54	64.16	79.70	19.58	19.05	20.08
Tawila	91.18	82.75	98.23	17.71	17.39	18.01
Melit	79.63	67.14	90.48	17.71	17.35	18.16
Um Kadada	72.67	63.96	83.48	18.97	18.56	19.39
Kebkabiya	74.75	64.84	83.77	18.26	17.96	18.56
Kutum	72.55	58.82	85.17	17.82	17.25	18.36
El Mahalha	75.00	59.99	88.89	18.43	17.98	19.01
Saraf Omra	78.57	67.84	87.25	17.85	17.37	18.40
El Serief	77.98	68.58	87.86	16.88	16.38	17.30
Dar Elsalam	79.78	66.30	89.77	17.92	17.57	18.32
Kelemando	85.19	76.64	93.11	18.14	17.75	18.62
El Tawisha	66.06	53.19	77.10	18.29	17.97	18.63
Um Baru	82.05	67.43	93.76	17.91	17.44	18.52
El Lait	85.71	76.70	93.21	18.68	18.25	19.15
ELkuma	68.29	42.86	91.32	19.91	19.13	21.09
El Tina	100.00	100.00	100.00	20.44	18.33	22.45
Kernoi	68.71	59.05	79.83	18.34	17.88	18.97
North Darfur State	76.75	65.66	87.83	18.47	17.84	19.10
Nyala South	69.50	56.60	82.10	18.90	18.38	19.41
Nyala North	64.44	36.75	86.54	18.30	17.37	19.58
Es Salam	75.14	65.75	82.85	17.31	16.98	17.63
El Wihda	85.00	74.65	93.67	18.50	18.12	18.83
Mershing	72.63	64.72	81.18	18.11	17.79	18.44
Beliel	64.47	51.71	75.01	19.56	19.07	19.98
Nitega	69.14	55.67	83.33	18.19	17.53	18.83
Sharg El Jabal (accessible parts)	100.00	100.00	100.00	17.80	17.07	18.47
Kas	91.23	82.97	97.44	16.99	16.38	17.61
Shattaya	80.65	68.87	91.41	16.21	15.85	16.57
Buram	71.43	58.15	82.99	16.65	16.24	17.05
Gereida	79.49	66.37	89.60	17.71	17.27	18.21
El Sunta	82.86	71.99	94.57	17.12	16.75	17.56
El Radoum	71.97	60.14	81.70	16.61	16.31	16.95

TABLE 126: Early parity by locality

Location	Giving Birth between 15 and 19 years of age %			Age at First Parity (years)		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Tulus	72.34	48.64	85.73	17.49	16.77	18.42
Damso	71.21	57.74	87.70	17.36	16.94	17.76
Ed Elfursan	93.85	83.89	99.35	17.79	17.30	18.45
Kubum	66.06	53.06	76.93	17.60	17.26	17.91
Kateila	80.49	69.20	91.67	17.81	17.28	18.38
Rehaid Elbirdi	86.21	77.77	93.17	17.02	16.69	17.41
Um Dafoug	84.51	72.61	92.39	16.23	15.91	16.56
South Darfur State	76.55	62.63	90.47	17.64	17.03	18.24
Abu Jabra	83.16	69.23	93.76	17.39	16.93	17.95
Abu Karinka	78.82	70.39	86.51	19.46	19.01	19.90
Bahr El Arab	68.97	53.01	82.28	19.38	18.65	20.18
Adila	82.12	72.66	90.17	19.29	18.82	19.73
Ed Dain	69.35	54.10	83.34	19.04	18.48	19.67
Assalaya	88.19	81.05	94.67	17.83	17.54	18.18
El Firdous	72.04	60.54	82.74	17.65	17.20	18.22
Shia-ria	82.80	71.99	93.66	19.08	18.47	19.77
Yassin	65.29	53.28	77.14	19.49	19.06	19.93
East Darfur State	76.92	65.65	88.19	18.81	18.23	19.39
El Geneina	68.69	60.42	77.44	19.83	19.28	20.36
Habila	74.39	63.02	84.62	18.31	17.71	18.92
Kulbus	75.73	64.59	85.27	18.61	17.97	19.30
Beida	56.97	46.22	68.34	20.65	19.86	21.39
Foro Baranga	77.30	68.59	86.41	18.93	18.18	19.73
Kereneik	78.71	72.72	84.96	17.33	17.07	17.61
Sirba	76.92	61.11	88.69	20.87	20.18	21.64
Jebel Moon	84.29	73.98	92.14	20.61	19.78	21.40
West Darfur State	73.34	62.95	83.74	19.46	18.81	20.11
Zalingi	74.01	67.19	80.56	18.99	18.54	19.52
Wadi Salih	67.63	59.93	75.56	20.09	19.64	20.49
Mukjar	67.89	50.50	81.98	19.49	19.00	19.89
Central Jebel Mara	50.00	13.58	87.54	16.04	15.30	16.95
North Jebel Mara	96.15	83.33	100.00	17.32	16.46	18.31
Bendasi	71.23	57.13	85.55	17.34	16.88	17.79
Nertiti	87.59	78.46	94.51	17.77	17.45	18.12
Azum	89.84	82.23	95.41	17.95	17.58	18.39
Um Dukhun	88.30	79.19	95.49	16.77	16.44	17.07
Central Darfur State	74.10	54.83	93.37	18.06	17.47	18.66

Spatial distribution of early parity rates

There was an even spatial spread of high early parity rates across Sudan with small areas of low rates of early parity in Red Sea and Northern states *(see Figure 410 and Figure 412).*

FIGURE 410: Carer (aged 20 - 24): Carers first giving birth between 15 and 19 years of age (raster)

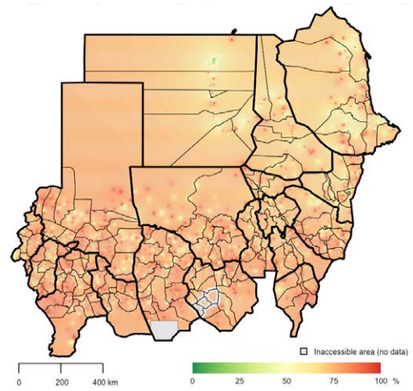


FIGURE 411: Carer (aged 20 - 24): Carers first giving birth between 15 and 19 years of age

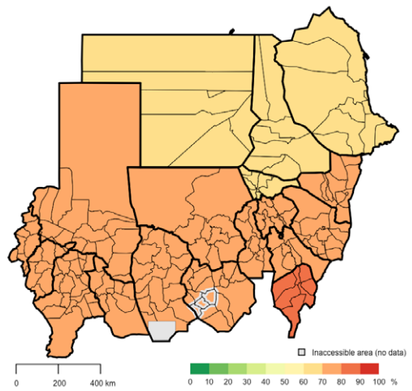


FIGURE 412: Carer: Age at first parity (raster)

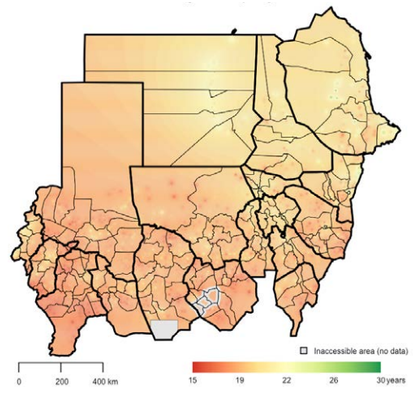
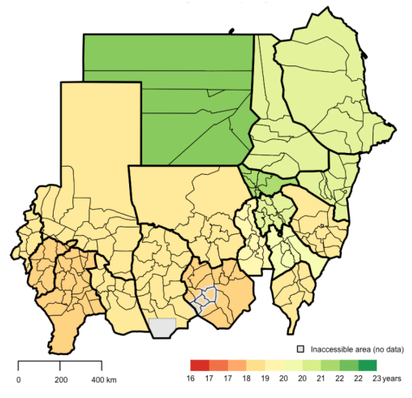


FIGURE 413: Carer: Age at first parity



3.22.3 Female genital mutilation (FGM) among girls

FGM among girls average results

The proportion of girls under 14 years old across Sudan who had undergone FGM was 27.2 per cent (95 per cent CI: 20.1-34.2 per cent). The prevalence was higher among the older girls in that age range. By age 14, for example, 68.8 per cent of them (95 per cent CI: 43.6-93.9 per cent) had undergone FGM. By contrast, the prevalence for girls under 8 years of age was 16.5 per cent (95 per cent CI: 10.1-22.8 per cent).

Red Sea state had the highest proportion of girls of all ages who had undergone FGM at 61.5 per cent (95 per cent CI: 53.5-69.6 per cent), while West Darfur state had the lowest proportion at 8.2 per cent (95 per cent CI: 2.9-13.4 per cent). Northern state had the highest proportion of girls aged 14 years who had

undergone FGM at 87.3 per cent (95 per cent CI: 64.3-99.9 per cent), while Central Darfur had the lowest at 24.8 per cent (95 per cent CI: 0.01-52.5 per cent). Red Sea state had the highest proportion of girls below 8 years of age who had undergone FGM at 57 per cent (95 per cent CI: 48.7-65.3 per cent), while West Darfur state had the lowest at 3.3 per cent (95 per cent CI: 0.53-6.13 per cent) *(see Figure 415).*

Among localities, the proportions were as follows: 62.2 per cent had more than 20 per cent of all girls who had undergone FGM; 69.2 per cent had more than 60 per cent of girls aged 14 years who had undergone FGM; and 41.6 per cent had more than 15 per cent of girls below 8 years of age who had undergone FGM *(see Figure 414).*

Table 127 and Table 128 present per state, per locality and national estimates of girls who experienced FGM in Sudan.

FIGURE 414: Box plot of locality results of girls undergoing FGM

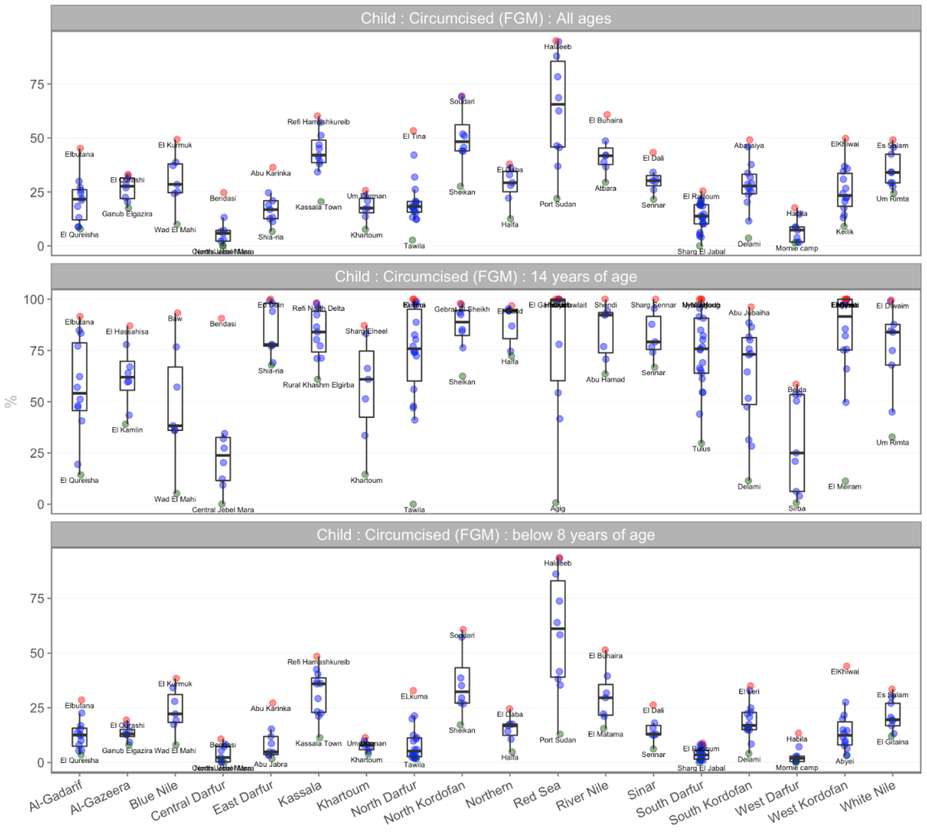


FIGURE 415: Box plot of state results of girls undergoing FGM

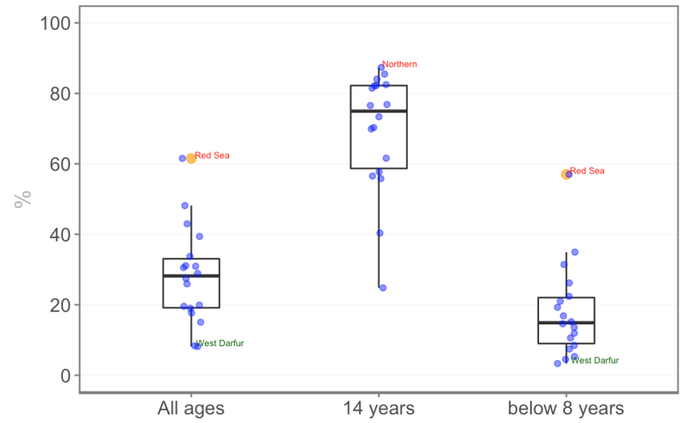


TABLE 127: FGM for girls of all ages, girls 14 years, and girls below 8 years of age by state and national

State	All ages %			14 years of age %			Below 8 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Al-Gadarif	19.89	12.16	27.62	56.53	26.23	86.83	11.97	5.81	18.13
Al-Gazeera	27.49	20.04	34.95	61.58	38.19	84.96	14.63	8.50	20.75
Blue Nile	30.93	21.13	40.73	55.81	25.62	86.00	22.40	11.85	32.96
Central Darfur	8.35	2.58	14.12	24.80	0.01	52.47	5.34	0.97	9.72
East Darfur	19.02	11.98	26.05	82.17	62.83	99.99	10.59	4.30	16.88
Kassala	42.99	35.13	50.84	82.23	63.75	99.99	31.41	22.80	40.01
Khartoum	17.71	11.19	24.23	57.73	30.95	84.51	7.45	2.14	12.77
North Darfur	19.57	11.78	27.36	70.29	39.58	99.99	8.48	1.80	15.16
North Kordofan	48.16	41.59	54.73	84.03	69.23	98.84	34.92	27.80	42.04
Northern	30.54	22.76	38.33	87.34	64.30	99.99	16.86	9.56	24.16
Red Sea	61.52	53.46	69.59	76.86	57.97	95.75	57.01	48.71	65.31
River Nile	39.39	32.86	45.93	85.43	64.69	99.99	26.22	19.81	32.62
Sennar	28.89	21.98	35.80	82.47	64.34	99.99	13.62	8.43	18.82
South Darfur	15.03	9.77	20.29	73.33	43.59	99.99	4.51	1.24	7.78
South Kordofan	31.12	22.91	39.32	69.92	46.18	93.66	20.98	13.89	28.06
West Darfur	8.15	2.89	13.42	40.36	9.93	70.80	3.33	0.53	6.13
West Kordofan	25.95	19.35	32.55	81.48	55.24	99.99	15.18	9.66	20.69
White Nile	33.70	26.92	40.48	76.57	50.48	99.99	19.30	12.81	25.78
Sudan	27.18	20.12	34.24	68.77	43.61	93.93	16.44	10.14	22.74

TABLE 128: FGM for girls of all ages, girls 14 years, and girls below 8 years of age by locality and state

Location	All ages %			14 years of age %			Below 8 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Dongola	28.06	23.24	33.30	75.66	54.95	91.46	14.26	9.15	20.13
El Golid	32.88	26.90	39.79	96.78	83.51	100.00	18.18	12.01	24.60
Merwoe	29.56	23.76	34.60	94.25	81.51	100.00	17.47	11.73	23.00
El Daba	38.28	28.20	49.92	93.54	71.30	100.00	24.79	13.01	38.49
Halfa	16.60	12.58	21.35	68.30	48.23	88.90	7.41	4.95	11.07
Delgo	36.95	31.30	42.64	94.25	68.96	100.00	18.58	13.82	23.40
El Burgaig	21.10	14.41	29.29	82.12	17.48	100.00	9.93	6.23	15.95
Northern State	30.54	22.76	38.33	87.34	64.30	99.99	16.86	9.56	24.16
El Matama	35.97	29.92	42.44	92.91	76.86	100.00	17.13	11.19	23.39
Shendi	39.06	32.01	45.02	100.00	94.74	100.00	22.74	17.30	28.81
Abu Hamad	47.83	41.95	53.51	82.82	43.62	100.00	37.88	31.79	44.12
Barbar	42.51	32.68	52.18	90.95	34.41	100.00	33.43	24.84	42.87
El Damar	41.47	35.07	47.32	67.06	47.88	85.20	29.48	23.90	35.75
Atbara	24.35	17.94	30.69	71.87	45.10	95.29	12.79	7.70	20.32
El Buhaira	60.09	51.97	68.77	92.75	86.74	98.12	49.28	38.08	60.81
River Nile State	39.39	32.86	45.93	85.43	64.69	99.99	26.22	19.81	32.62
Khartoum	7.72	4.73	10.99	15.61	0.38	39.14	4.20	1.43	6.67
Bahri	16.73	11.47	22.89	34.62	4.56	68.70	7.62	4.17	12.81
Um Durman	25.17	18.78	32.86	62.41	29.40	100.00	11.09	6.42	16.89
Um Bada	15.87	9.54	25.65	64.33	32.12	85.25	8.27	2.49	18.17
Jebel Awlia	14.23	8.46	21.63	50.50	19.25	82.22	8.60	4.13	13.94
Sharg Elneel	23.80	17.80	29.10	86.95	77.25	96.22	6.37	3.82	9.89
Karrari	21.30	16.78	26.44	79.13	45.45	96.24	6.68	3.35	11.88
Khartoum State	17.71	11.19	24.23	57.73	30.95	84.51	7.45	2.14	12.77
Greater Medani	19.87	13.93	25.66	58.31	37.35	80.25	9.09	5.23	14.32
Ganub Elgazira	22.49	14.36	30.97	56.18	34.78	77.58	12.27	5.34	20.85
El Hassahisa	25.84	18.30	33.00	74.79	47.97	95.62	11.30	6.32	16.22
El Kamlin	22.00	16.61	28.39	33.20	15.81	67.55	13.03	8.99	17.96
Sharg El Gezira	30.85	24.15	37.89	77.70	58.19	91.34	12.77	8.76	17.71
Um Elqura	26.27	17.68	34.37	78.25	54.65	96.02	10.26	6.72	15.32
El Manaqil	33.52	25.92	41.08	53.64	31.37	75.07	21.08	14.50	28.34
El Qurashi	33.19	26.53	40.39	68.96	37.77	95.58	19.12	11.52	27.62
Al-Gazeera State	27.49	20.04	34.95	61.58	38.19	84.96	14.63	8.50	20.75
Sennar	22.81	17.29	29.39	68.72	49.05	85.18	7.63	3.48	12.69
Sharg Sennar	25.89	19.68	32.51	99.64	84.56	100.00	12.68	8.88	17.25

TABLE 128: FGM for girls of all ages, girls 14 years, and girls below 8 years of age by locality and state

Location	All ages %			14 years of age %			Below 8 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Sinja	29.93	26.22	34.62	74.19	51.41	92.21	12.90	9.08	16.97
Abu Hujar	28.77	21.07	34.97	89.42	63.24	100.00	13.74	7.19	19.61
El Dali	45.14	38.51	52.48	97.00	88.01	100.00	28.50	20.06	36.51
Es Suki	30.70	23.39	37.86	83.60	61.94	98.10	15.28	9.75	21.62
Ed Dinder	33.33	23.94	41.72	82.09	55.45	97.91	17.56	12.34	24.36
Sennar State	28.89	21.98	35.80	82.47	64.34	99.99	13.62	8.43	18.82
Ed Damazine	31.72	24.32	40.37	77.72	62.69	90.22	18.95	12.85	26.05
El Tadamon	23.92	17.19	31.97	23.41	0.00	96.45	22.22	15.64	30.00
El Roseiris	25.20	18.21	31.99	37.55	18.37	60.88	17.59	11.42	23.97
Baw	39.09	31.64	45.67	92.14	55.01	100.00	28.79	21.82	36.78
Geisan	37.25	21.73	52.01	40.31	10.59	76.35	33.92	19.55	48.74
El Kurmuk	49.30	32.37	66.92	77.65	32.48	100.00	37.89	14.71	56.93
Wad El Mahi	13.44	9.24	19.05	19.55	4.17	48.22	8.81	5.60	12.06
Blue Nile State	30.93	21.13	40.73	55.81	25.62	86.00	22.40	11.85	32.96
Kosti	34.23	28.67	40.66	84.28	69.58	95.88	18.60	13.65	23.59
Guli	44.64	38.78	49.24	74.27	42.73	95.45	29.07	23.87	36.15
Tendalti	26.42	19.21	34.70	73.82	28.34	100.00	16.74	10.37	24.66
Es Salam	49.40	43.85	55.34	89.42	68.78	99.32	33.92	27.21	40.71
Rabak	25.76	17.49	33.45	70.65	47.47	88.16	14.03	8.66	19.48
El Jabalain	39.91	32.61	47.43	98.51	89.31	100.00	24.11	15.92	33.52
El Diwaim	35.41	29.45	41.70	99.89	72.79	100.00	21.25	15.04	27.35
Um Rimta	25.00	18.60	32.17	34.77	2.24	69.02	13.23	9.60	17.76
El Gitaina	30.88	23.37	37.73	45.53	0.40	84.92	13.63	8.37	19.28
White Nile State	33.70	26.92	40.48	76.57	50.48	99.99	19.30	12.81	25.78
Port Sudan	25.69	17.58	34.99	47.14	19.10	76.02	16.17	10.69	23.02
Swakin	44.15	38.79	50.43	42.49	19.68	71.66	37.97	31.56	45.37
El Gonob Welawlaib	58.14	41.51	72.79	85.99	60.03	100.00	54.23	40.59	68.43
Sinkat	62.85	57.68	68.09	78.96	57.85	99.95	58.84	52.63	64.64
Haya	94.42	89.35	98.47	100.00	100.00	100.00	93.10	86.10	97.47
Dordieb	88.31	82.06	93.49	99.83	99.53	100.00	85.80	79.00	92.66
Tokar	42.83	36.27	52.19	100.00	97.76	100.00	32.45	23.33	44.89
Agig	38.62	29.08	49.03	0.70	0.24	100.00	37.71	28.48	48.92
Gabaot Elma-aadin	68.62	54.43	80.83	99.16	97.91	100.00	64.97	49.62	77.93
Halaeeb (accessible parts)	95.35	85.18	100.00	100.00	99.61	100.00	98.00	89.83	100.00
Red Sea State	61.52	53.46	69.59	76.86	57.97	95.75	57.01	48.71	65.31

TABLE 128: FGM for girls of all ages, girls 14 years, and girls below 8 years of age by locality and state

Location	All ages %			14 years of age %			Below 8 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kassala Town	20.78	15.20	26.85	69.71	46.30	93.61	11.49	6.75	17.06
Refi Kassla	33.91	27.19	40.83	73.29	49.59	89.60	22.99	16.31	32.83
Rural Western Kassala	39.92	32.69	46.44	91.96	69.42	99.62	27.92	21.42	35.97
New Halfa	39.37	31.97	47.09	79.10	60.72	95.37	24.45	16.31	34.07
Refi Nahr Atbara	47.80	38.11	57.82	95.46	79.23	100.00	36.56	28.07	44.84
Rural Khashm Elgirba	41.85	28.69	52.88	63.02	42.38	83.70	37.07	24.26	48.42
Rural Wad Elhilaiw	40.57	29.20	54.95	66.86	39.91	91.00	32.99	22.66	45.57
Rural Aroma	55.88	44.47	65.47	91.41	78.59	100.00	46.29	36.00	57.69
Refi North Delta	39.09	32.46	44.36	98.11	97.09	98.86	22.04	16.71	27.94
Refi Hamashkureib	59.89	53.72	66.62	81.84	62.26	100.00	48.23	40.00	56.30
Rural Telkok	57.44	50.58	64.03	97.70	88.29	99.02	42.69	33.42	50.23
Kassala State	42.99	35.13	50.84	82.23	63.75	99.99	31.41	22.80	40.01
Gedaref Town	21.46	15.75	27.73	76.55	54.40	91.64	9.67	6.61	12.82
Middle Geddaref	30.34	20.07	40.43	64.42	30.69	90.86	22.61	12.35	33.74
Elbutana	46.67	38.81	53.37	90.63	62.06	100.00	29.23	22.89	36.25
El Fashaga	25.83	18.60	33.58	84.06	47.66	100.00	13.44	8.05	21.35
El Rahad	8.53	2.23	16.09	43.10	0.00	83.56	5.10	1.57	11.58
Gala-a El Nahal	21.74	14.46	29.87	77.35	39.86	100.00	11.97	6.33	19.06
El Fao	23.65	17.99	28.69	51.78	29.51	75.19	13.80	9.71	17.94
El Qureisha	14.12	7.43	22.13	18.81	0.00	56.68	8.17	3.60	13.99
El Mafaza	18.63	9.07	28.79	52.71	16.67	90.91	12.80	5.66	21.43
Basunda	15.93	7.82	24.62	56.22	28.70	80.58	9.70	3.84	16.24
Western Galabat	21.41	15.34	29.58	47.86	24.76	76.56	12.76	8.67	17.92
Eastern Galabat	9.45	4.21	17.09	24.20	3.08	50.61	7.02	2.56	12.30
Al-Gadarif State	19.89	12.16	27.62	56.53	26.23	86.83	11.97	5.81	18.13
Sheikan	29.03	24.74	33.27	64.92	44.10	83.86	18.67	15.23	22.56
Um Rawaba	45.07	41.47	49.27	85.22	72.77	94.96	30.71	26.27	36.09
Um Dam Haj Ahmed	51.09	44.48	57.49	87.00	67.69	100.00	35.19	28.10	42.41
El Rahad	50.15	41.53	58.90	93.93	81.49	100.00	32.85	24.25	42.65
Bara	47.59	41.49	52.95	84.14	48.88	100.00	30.53	22.98	37.49
Gharb Bara	47.34	41.16	53.08	98.35	91.43	100.00	32.01	24.43	38.55
Soudari	71.90	63.07	78.46	95.27	71.65	100.00	63.34	54.85	72.29
Gebrat El Sheikh	69.12	59.28	78.33	97.92	93.73	99.61	55.03	42.85	67.43
North Kordofan State	48.16	41.59	54.73	84.03	69.23	98.84	34.92	27.80	42.04

TABLE 128: FGM for girls of all ages, girls 14 years, and girls below 8 years of age by locality and state

Location	All ages %			14 years of age %			Below 8 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kadugli	25.08	20.22	30.49	53.39	37.94	71.45	16.86	12.58	22.65
Reif Shargi	20.18	12.23	32.98	34.88	4.01	65.70	15.16	7.97	25.40
Dilling	10.21	1.27	21.02	24.76	0.00	69.97	5.68	0.00	12.34
El Quoz	36.10	28.89	42.70	85.57	63.08	98.35	22.03	16.54	27.95
Habila	22.55	17.92	29.16	84.66	56.73	100.00	14.19	9.90	20.04
Abassiya	47.30	37.41	57.43	80.05	62.26	94.94	32.04	24.14	40.89
El Rashad	26.80	12.28	42.11	64.02	30.55	91.90	21.00	8.03	36.66
Abu Jubaiha	39.08	35.03	43.39	96.56	88.48	100.00	28.53	24.59	34.02
El Tadamon	34.14	29.04	40.45	56.47	32.70	82.67	24.29	18.80	30.40
Talodi	36.18	24.98	47.20	75.27	33.88	100.00	21.09	13.27	31.78
Ghadeer	27.09	20.05	33.26	86.13	73.02	99.02	14.60	9.30	20.39
El Leri	44.59	36.57	51.17	89.39	64.75	100.00	34.20	26.28	42.44
Abu Karshola	29.17	23.43	35.34	69.67	37.36	91.14	16.60	12.81	22.27
Delami	6.03	0.44	16.64	10.76	0.23	38.90	3.51	0.32	11.56
South Kordofan State	31.12	22.91	39.32	69.92	46.18	93.66	20.98	13.89	28.06
Abu Zabad	37.69	31.90	43.62	97.47	86.36	100.00	27.05	20.78	33.83
ElKhiwai	48.82	38.28	56.78	100.00	95.69	100.00	43.01	34.10	51.41
Ghubaish	22.52	17.95	27.23	69.31	25.22	99.16	10.41	5.56	14.89
El Nuhud	32.60	24.73	40.22	90.85	72.80	100.00	20.18	12.40	27.22
El Idia	17.77	13.14	22.86	52.10	28.51	75.23	8.17	4.29	13.36
Wad Benda	30.23	25.69	34.61	97.69	86.54	100.00	14.09	9.77	19.41
Lagawa	26.40	20.00	33.46	100.00	86.50	100.00	9.59	6.11	14.79
Elsunut	26.29	18.27	34.01	76.18	27.10	100.00	14.96	8.33	23.02
Keilik	9.15	5.99	12.95	84.60	26.34	100.00	6.54	4.17	9.28
Es Salam	22.72	18.74	26.97	67.11	41.59	84.98	15.44	11.11	19.59
Babanusa	32.99	23.26	39.75	99.80	97.43	100.00	18.89	11.80	24.75
Abyei	13.07	7.89	18.79	100.00	97.48	100.00	3.43	0.89	5.96
El Dibab	10.63	3.64	19.04	86.10	0.00	100.00	3.16	0.98	5.92
El Meiram	14.04	9.21	19.10	11.49	0.00	57.23	13.30	7.52	19.19
West Kordofan State	25.95	19.35	32.55	81.48	55.24	99.99	15.18	9.66	20.69
El Fasher	14.45	11.39	17.82	56.04	38.28	72.05	4.83	3.18	6.70
Tawila	2.76	1.23	4.86	1.48	0.00	17.19	1.36	0.18	3.43
Melit	15.49	11.51	19.80	78.60	59.30	96.62	4.48	2.03	6.96
Um Kadada	15.85	12.69	19.00	96.82	75.01	100.00	4.33	2.37	6.72

TABLE 128: FGM for girls of all ages, girls 14 years, and girls below 8 years of age by locality and state

Location	All ages %			14 years of age %			Below 8 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
Kebkabiya	27.23	21.03	33.19	75.84	19.28	92.93	21.94	16.71	27.50
Kutum	18.32	11.98	24.52	49.86	26.99	82.45	8.85	5.48	12.93
El Mahalha	19.49	13.01	27.37	72.40	35.84	100.00	9.95	5.25	15.89
Saraf Omra	16.92	7.35	30.50	44.70	0.00	92.45	11.90	3.09	22.87
El Serief	15.86	11.38	20.48	100.00	97.30	100.00	2.53	0.96	4.50
Dar Elsalam	13.40	8.58	18.29	68.25	53.28	85.15	1.58	0.24	3.52
Kelemando	16.67	13.14	20.12	77.11	54.35	96.74	3.45	1.69	5.49
El Tawisha	12.94	8.91	17.39	78.01	55.79	92.29	2.33	0.86	5.31
Um Baru	21.40	15.10	27.25	98.56	28.26	100.00	6.17	2.84	10.65
El Lait	18.17	13.90	22.47	91.03	73.32	100.00	2.51	1.10	4.66
ELkuma	41.75	29.31	53.13	46.83	29.05	100.00	32.23	20.86	43.10
El Tina	53.33	26.67	73.33	100.00	96.62	100.00	20.00	0.00	50.00
Kernoi	31.66	27.15	36.08	98.05	90.84	100.00	10.78	7.96	13.63
North Darfur State	19.57	11.78	27.36	70.29	39.58	99.99	8.48	1.80	15.16
Nyala South	19.06	15.40	22.87	78.68	60.94	98.05	6.73	4.65	9.25
Nyala North	20.57	12.34	28.03	100.00	71.47	100.00	8.26	3.10	13.52
Es Salam	16.63	13.13	20.16	70.93	50.98	86.72	4.96	2.91	7.33
El Wihda	11.23	7.32	16.04	73.63	40.56	98.40	4.08	1.80	6.89
Mershing	6.39	3.41	9.95	56.60	24.84	83.24	1.88	0.27	4.19
Beliel	10.84	8.52	13.35	67.36	46.84	83.92	1.16	0.35	2.48
Nitega	3.69	1.41	6.18	98.39	11.12	100.00	1.25	0.26	3.08
Sharg El Jabal (accessible parts)	0.00	0.00	0.00	NA	NA	NA	0.00	0.00	0.00
Kas	20.13	16.75	23.63	84.11	64.04	98.88	5.41	3.35	7.40
Shattaya	16.43	7.74	24.77	59.90	33.08	90.71	4.46	1.28	8.38
Buram	18.70	11.97	27.58	75.48	51.97	90.72	3.60	1.46	6.58
Gereida	18.86	13.25	24.70	77.48	60.65	90.97	7.36	4.53	10.70
El Sunta	4.78	1.77	8.62	15.16	0.00	96.80	0.61	0.00	2.07
El Radoum	24.38	19.20	30.52	90.67	77.29	100.00	8.05	2.77	14.38
Tulus	5.41	0.50	12.56	31.36	0.00	97.43	1.15	0.00	4.01
Damso	12.85	7.32	20.06	47.12	22.72	72.78	7.14	2.73	12.69
Ed Elfursan	14.85	10.27	19.92	83.50	59.07	100.00	3.69	1.81	6.43
Kubum	13.45	10.18	17.63	95.42	77.96	100.00	2.21	0.63	4.69
Kateila	13.94	8.70	18.85	89.59	45.27	100.00	3.23	0.26	6.49
Rehaid Elbirdi	18.86	13.56	24.12	63.72	38.13	91.27	5.08	2.37	8.42
Um Dafoug	19.18	14.14	23.78	100.00	78.23	100.00	2.68	1.04	4.97

TABLE 128: FGM for girls of all ages, girls 14 years, and girls below 8 years of age by locality and state

Location	All ages %			14 years of age %			Below 8 years of age %		
	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL	Estimate	95% LCL	95% UCL
South Darfur State	15.03	9.77	20.29	73.33	43.59	99.99	4.51	1.24	7.78
Abu Jabra	14.36	10.89	18.17	76.75	58.62	92.87	2.33	0.84	5.89
Abu Karinka	32.06	23.69	41.76	68.38	32.43	96.64	24.78	17.19	32.19
Bahr El Arab	17.67	5.63	31.45	98.82	77.15	100.00	15.81	5.53	27.25
Adila	24.37	19.38	29.55	92.58	43.05	100.00	12.09	7.93	16.46
Ed Dain	24.09	19.51	30.34	99.79	83.26	100.00	7.24	3.88	11.87
Assalaya	12.88	9.59	16.67	68.35	46.92	86.34	3.57	1.99	6.12
El Firdous	9.09	4.59	13.58	63.16	27.94	85.37	3.94	1.29	7.28
Shia-ria	6.17	3.12	9.91	67.53	4.92	77.27	3.02	0.25	6.34
Yassin	20.11	15.29	25.55	96.23	76.48	100.00	9.41	6.38	14.43
East Darfur State	19.02	11.98	26.05	82.17	62.83	99.99	10.59	4.30	16.88
El Geneina	9.29	6.17	12.98	53.95	32.19	75.92	2.65	1.06	4.72
Habila	16.40	7.98	25.76	20.73	0.00	64.12	11.76	5.61	18.69
Kulbus	8.83	1.74	17.13	54.34	10.05	78.76	3.02	0.40	6.68
Beida	4.37	1.34	8.29	55.93	7.88	100.00	0.66	0.00	3.14
Foro Baranga	14.31	10.76	19.32	49.78	5.93	89.08	6.65	3.90	10.00
Kereneik	2.29	0.96	3.92	8.93	0.42	25.82	0.28	0.00	0.97
Sirba	1.25	0.00	3.51	1.05	0.00	19.24	0.73	0.00	2.28
Jebel Moon	10.40	4.38	16.31	57.77	3.88	84.34	4.96	2.37	7.85
West Darfur State	8.15	2.89	13.42	40.36	9.93	70.80	3.33	0.53	6.13
Zalingi	15.75	9.43	23.17	19.99	7.95	37.84	14.90	8.68	22.20
Wadi Salih	6.88	2.94	12.73	26.25	0.77	71.85	6.55	2.06	12.99
Mukjar	7.05	2.41	14.20	31.80	0.00	98.77	2.15	0.00	7.08
Central Jebel Mara	0.00	0.00	1.44	0.06	0.03	0.18	0.00	0.00	2.16
North Jebel Mara	0.00	0.00	0.00	NA	NA	NA	0.00	0.00	0.00
Bendasi	26.25	17.47	35.12	91.77	68.30	100.00	10.96	6.49	16.73
Nertiti	2.67	0.44	6.06	5.82	0.00	31.33	1.05	0.00	3.04
Azum	3.47	0.99	7.28	19.00	1.80	52.37	0.79	0.00	3.02
Um Dukhun	14.16	8.61	20.94	30.85	0.00	80.42	9.07	3.38	15.28
Central Darfur State	8.35	2.58	14.12	24.80	0.01	52.47	5.34	0.97	9.72

Spatial distribution of FGM among girls

There was a decreasing spatial trend in the proportion of girls who experienced FGM, moving from the east to the west of Sudan, with the highest rate in areas of Red Sea state and the lowest in areas of the Darfur states *(see Figure 416, Figure 418, and Figure 420)*.

FIGURE 416:
Child: Circumcised (FGM): All ages (raster)

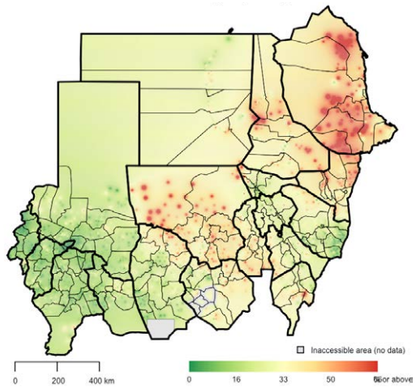


FIGURE 417:
Child: Circumcised (FGM): All ages

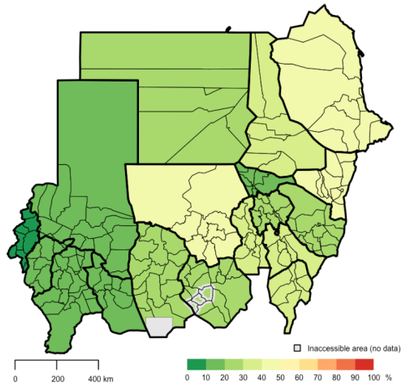


FIGURE 418:
Child: Circumcised (FGM): 14 years of age (raster)

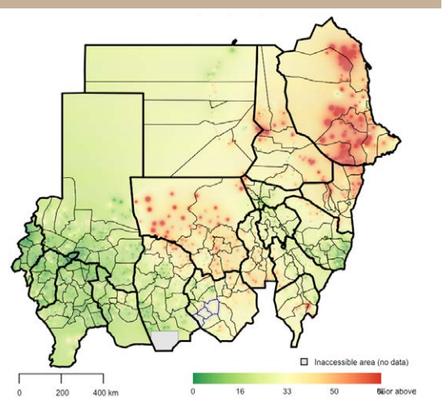


FIGURE 419:
Child: Circumcised (FGM): 14 years of age

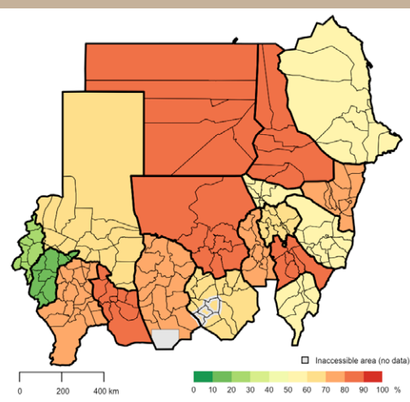


FIGURE 420:
Child: Circumcised (FGM): Below 8 years of age (raster)

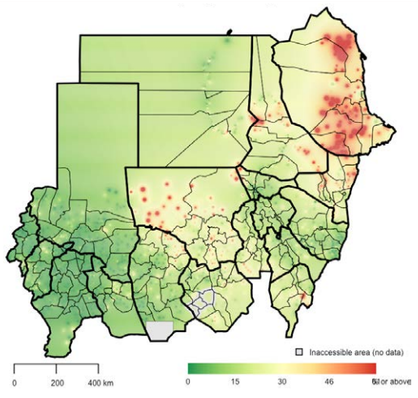
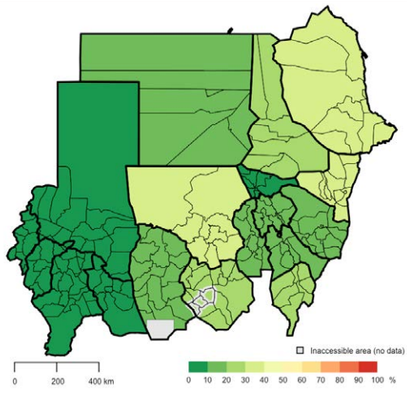


FIGURE 421:
Child: Circumcised (FGM): Below 8 years of age



3.22.4 Birth certificate and birth registration

Birth certificates and registration average results

Birth registration or possession of a birth certificate for children of either gender was low at only 60.4 per cent (95 per cent CI: 51.0-69.8 per cent) across Sudan.

Northern state had the highest rate of birth registration or possession of birth certificates at 98.4 per cent (95 per cent CI: 96.6-99.9 per cent), while Central Darfur state had the lowest rate at 12.3 per cent (95 per cent CI: 6.7-17.8 per cent). Among localities, 45.9 per cent had a higher than 50 per cent rate of birth registrations or possession of birth certificates *(see Figure 422)*.

Table 129 and Table 130 presents per state, per locality and national rates of birth registration or possession of birth certificates.

FIGURE 422: Box plot of locality results of birth registration or possession of birth certificate

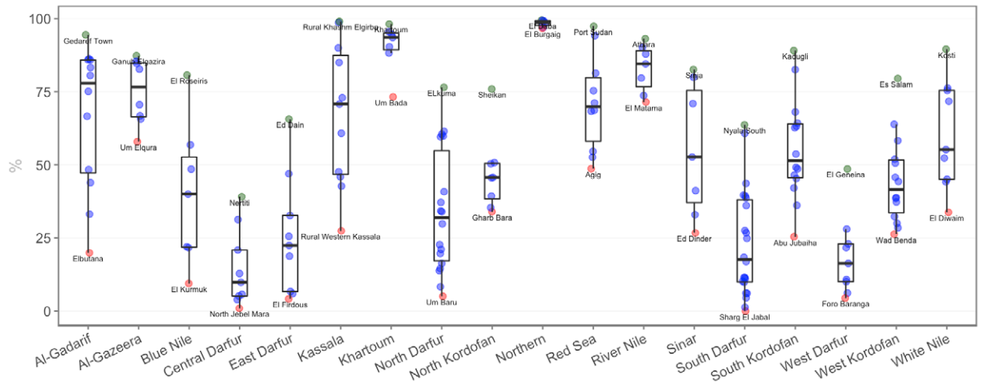


TABLE 129: Birth certificate or birth registration by state and national

Birth Certificate or Birth Registration			
State	**Estimate**	**95% LCL**	**95% UCL**
Al-Gadarif	70.61	60.50	80.72
Al-Gazeera	74.80	64.81	84.79
Blue Nile	48.50	39.86	57.14
Central Darfur	12.25	6.72	17.78
East Darfur	24.20	16.03	32.37
Kassala	69.71	59.42	80.00
Khartoum	90.44	83.39	97.48
North Darfur	34.52	25.53	43.51
North Kordofan	49.28	39.49	59.07
Northern	98.44	96.62	99.99
Red Sea	71.04	56.50	85.57
River Nile	83.24	75.83	90.64

TABLE 129: Birth certificate or birth registration by state and national

Birth Certificate or Birth Registration			
State	**Estimate**	**95% LCL**	**95% UCL**
Sennar	57.15	46.38	67.92
South Darfur	27.29	16.24	38.33
South Kordofan	51.85	40.47	63.23
West Darfur	27.29	20.14	34.45
West Kordofan	43.64	33.58	53.71
White Nile	64.74	56.03	73.46
Sudan	60.37	50.95	69.79

TABLE 130: Birth certificate or birth registration by locality and by state

Birth Certificate or Birth Registration			
Location	**Estimate**	**95% LCL**	**95% UCL**
Dongola	99.36	98.19	100.00
El Golid	98.51	96.21	99.85
Merwoe	97.22	93.36	99.42
El Daba	99.66	98.23	100.00
Halfa	98.65	97.46	99.55
Delgo	98.99	97.76	99.85
El Burgaig	96.92	94.37	98.88
Northern State	98.44	96.62	99.99
El Matama	72.34	61.12	82.92
Shendi	85.50	75.47	93.51
Abu Hamad	76.95	70.40	82.82
Barbar	86.35	79.31	91.72
El Damar	82.60	77.22	88.27
Atbara	92.04	86.37	96.99
El Buhaira	90.23	84.77	94.59
River Nile State	83.24	75.83	90.64
Khartoum	97.88	95.76	99.28
Bahri	94.80	89.79	98.29
Um Durman	93.88	90.18	96.85
Um Bada	81.20	67.19	94.00
Jebel Awlia	94.88	90.62	97.91
Sharg Elneel	87.60	79.06	94.90
Karrari	87.80	81.86	92.41
Khartoum State	90.44	83.39	97.48
Greater Medani	84.86	75.75	93.17
Ganub Elgazira	86.29	80.99	91.47

TABLE 130: Birth certificate or birth registration by locality and by state

Birth Certificate or Birth Registration			
Location	**Estimate**	**95% LCL**	**95% UCL**
El Hassahisa	81.68	75.21	87.72
El Kamlin	82.05	71.46	92.10
Sharg El Gezira	70.43	60.04	79.55
Um Elqura	60.18	45.64	73.32
El Manaqil	66.00	50.22	77.26
El Qurashi	66.18	57.61	74.77
Al-Gazeera State	74.80	64.81	84.79
Sennar	77.80	69.22	84.23
Sharg Sennar	53.12	41.19	61.97
Sinja	82.64	73.50	89.70
Abu Hujar	35.78	23.78	48.77
El Dali	35.62	23.92	49.53
Es Suki	67.31	54.06	81.22
Ed Dinder	20.63	13.40	30.55
Sennar State	57.15	46.38	67.92
Ed Damazine	65.02	55.45	74.41
El Tadamon	21.47	12.26	30.36
El Roseiris	80.27	73.52	86.27
Baw	46.46	35.39	55.01
Geisan	22.21	15.61	28.62
El Kurmuk	8.59	1.75	20.59
Wad El Mahi	36.97	29.34	45.61
Blue Nile State	48.50	39.86	57.14
Kosti	90.16	85.39	94.04
Guli	75.29	67.56	81.51
Tendalti	58.15	48.74	65.99
Es Salam	44.30	33.54	54.37
Rabak	74.02	66.91	81.32
El Jabalain	63.04	50.68	74.33
El Diwaim	32.31	19.62	48.43
Um Rimta	43.48	33.97	52.58
El Gitaina	72.25	65.49	79.31
White Nile State	64.74	56.03	73.46
Port Sudan	96.43	92.90	98.94
Swakin	92.82	89.42	95.59
El Gonob Welawlaib	78.65	65.63	86.55
Sinkat	68.90	55.07	78.71
Haya	54.39	30.28	75.54
Dordieb	66.62	50.41	79.93
Tokar	60.49	45.34	72.64

TABLE 130: Birth certificate or birth registration by locality and by state

Birth Certificate or Birth Registration			
Location	**Estimate**	**95% LCL**	**95% UCL**
Agig	46.67	33.70	60.39
Gabaot Elma-aadin	81.29	70.12	90.31
Halaeeb (accessible parts)	62.84	47.91	81.25
Red Sea State	71.04	56.50	85.57
Kassala Town	98.50	95.56	100.00
Refi Kassla	87.71	80.13	94.04
Rural Western Kassala	30.81	18.70	45.29
New Halfa	84.88	76.52	92.18
Refi Nahr Atbara	45.70	31.55	58.93
Rural Khashm Elgirba	99.42	96.19	100.00
Rural Wad Elhilaiw	54.72	41.42	68.04
Rural Aroma	31.97	18.13	48.08
Refi North Delta	69.31	61.46	76.19
Refi Hamashkureib	70.01	52.20	83.11
Rural Telkok	45.36	33.04	55.67
Kassala State	69.71	59.42	80.00
Gedaref Town	93.75	88.32	97.31
Middle Geddaref	87.53	71.59	96.08
Elbutana	22.11	14.97	30.36
El Fashaga	32.68	22.98	44.59
El Rahad	65.20	55.72	74.10
Gala-a El Nahal	48.14	37.72	60.49
El Fao	80.84	71.86	87.24
El Qureisha	82.99	74.59	91.02
El Mafaza	51.45	36.75	66.89
Basunda	81.02	67.87	90.87
Western Galabat	85.85	79.26	92.01
Eastern Galabat	71.43	63.55	80.18
Al-Gadarif State	70.61	60.50	80.72
Sheikan	71.20	64.65	77.42
Um Rawaba	46.93	36.46	58.08
Um Dam Haj Ahmed	45.78	32.97	59.51
El Rahad	54.15	42.68	63.12
Bara	38.98	30.37	47.69
Gharb Bara	30.00	22.02	40.61
Soudari	30.50	19.92	40.85
Gebrat El Sheikh	44.04	31.58	56.08
North Kordofan State	49.28	39.49	59.07
Kadugli	88.58	84.39	92.03

TABLE 130: Birth certificate or birth registration by locality and by state

Birth Certificate or Birth Registration			
Location	**Estimate**	**95% LCL**	**95% UCL**
Reif Shargi	62.42	54.25	69.95
Dilling	70.29	54.45	85.20
El Quoz	48.87	39.19	58.61
Habila	77.13	68.48	84.43
Abassiya	44.46	34.39	53.52
El Rashad	36.21	28.97	48.10
Abu Jubaiha	30.67	19.62	42.60
El Tadamon	37.32	25.39	48.21
Talodi	70.64	48.64	85.64
Ghadeer	48.73	27.02	65.44
El Leri	52.38	43.32	62.86
Abu Karshola	45.48	36.88	54.97
Delami	43.62	25.84	66.02
South Kordofan State	51.85	40.47	63.23
Abu Zabad	58.47	44.08	70.88
ElKhiwai	49.87	41.37	59.66
Ghubaish	47.44	39.43	55.83
El Nuhud	45.24	36.98	53.17
El Idia	58.15	45.15	70.99
Wad Benda	25.99	16.28	34.69
Lagawa	35.75	23.82	47.49
Elsunut	33.78	22.51	44.14
Keilik	28.19	22.45	33.72
Es Salam	80.57	72.36	86.62
Babanusa	37.64	30.23	44.63
Abyei	32.32	23.06	40.37
El Dibab	30.74	12.57	48.39
El Meiram	29.70	18.64	37.77
West Kordofan State	43.64	33.58	53.71
El Fasher	66.23	60.30	73.46
Tawila	60.92	57.03	65.04
Melit	38.71	28.23	51.00
Um Kadada	58.91	48.15	69.16
Kebkabiya	14.81	9.48	21.66
Kutum	34.09	25.35	42.00
El Mahalha	15.29	8.86	22.05
Saraf Omra	16.17	10.36	23.72
El Serief	18.68	13.70	25.17
Dar Elsalam	28.29	18.48	39.34
Kelemando	34.30	25.10	45.05

TABLE 130: Birth certificate or birth registration by locality and by state

Location	Birth Certificate or Birth Registration		
	Estimate	95% LCL	95% UCL
El Tawisha	21.01	16.81	25.05
Um Baru	6.07	1.82	12.16
El Lait	28.41	19.71	37.82
ELkuma	73.93	42.67	92.65
El Tina	8.33	0.00	25.00
Kernoi	18.58	13.26	24.34
North Darfur State	34.52	25.53	43.51
Nyala South	65.14	55.72	73.13
Nyala North	60.10	47.13	75.81
Es Salam	10.13	4.75	17.91
El Wihda	28.15	16.57	40.13
Mershing	37.10	25.14	48.30
Beliel	26.59	20.44	33.71
Nitega	37.88	30.12	45.70
Sharg El Jabal (accessible parts)	0.00	0.00	0.00
Kas	16.35	9.97	23.88
Shattaya	15.32	10.55	21.24
Buram	5.92	4.26	8.05
Gereida	36.07	27.29	46.74
El Sunta	19.65	12.00	27.40
El Radoum	5.67	2.36	9.48
Tulus	38.85	14.63	58.56
Damso	40.49	26.39	53.38
Ed Elfursan	11.57	7.37	17.08
Kubum	10.26	7.28	13.18
Kateila	9.40	5.32	14.52
Rehaid Elbirdi	3.97	1.66	6.95
Um Dafoug	1.34	0.13	3.47
South Darfur State	27.29	16.24	38.33
Abu Jabra	17.42	9.49	26.83
Abu Karinka	39.94	28.98	49.95
Bahr El Arab	5.51	1.68	10.66
Adila	25.66	16.24	33.81
Ed Dain	65.29	56.34	74.15
Assalaya	6.67	3.04	11.69
El Firdous	7.15	2.88	11.83
Shia-ria	19.42	10.55	29.32
Yassin	37.37	25.31	47.71
East Darfur State	24.20	16.03	32.37

TABLE 130: Birth certificate or birth registration by locality and by state

Location	Birth Certificate or Birth Registration		
	Estimate	95% LCL	95% UCL
El Geneina	56.61	47.17	65.01
Habila	8.89	4.22	15.80
Kulbus	28.30	18.43	37.02
Beida	6.54	3.84	9.70
Foro Baranga	4.52	2.95	6.31
Kereneik	20.31	16.00	25.81
Sirba	14.47	10.19	19.48
Jebel Moon	10.22	6.02	15.36
West Darfur State	27.29	20.14	34.45
Zalingi	35.19	26.89	44.28
Wadi Salih	9.56	5.19	15.42
Mukjar	5.08	2.77	7.54
Central Jebel Mara	4.05	0.00	10.80
North Jebel Mara	1.36	0.00	4.39
Bendasi	19.18	13.30	25.93
Nertiti	40.54	33.63	47.94
Azum	11.56	7.17	16.72
Um Dukhun	5.83	2.39	10.05
Central Darfur State	12.25	6.72	17.78

Spatial distribution of birth certificates and registration

There was a decreasing spatial trend of birth registration or possession of a birth certificate by both genders, moving from the east to the west of Sudan with the highest rates in areas of Northern, River Nile and Khartoum states. Areas of the Darfur states had the lowest rates *(see Figure 423).*

FIGURE 423:
Child: Child has a birth certificate / birth has been registered (raster)

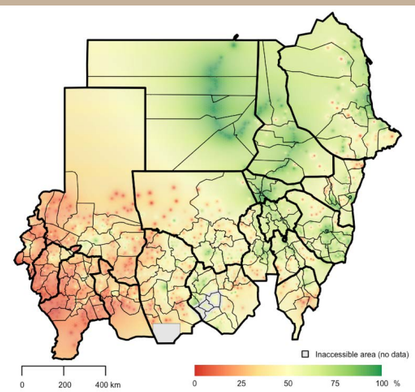
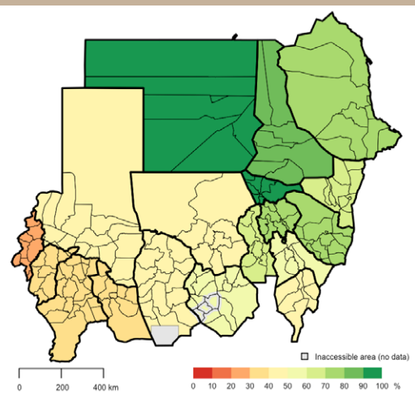


FIGURE 424:
Child: Child has a birth certificate / birth has been registered



3.23 Child health insurance

Health insurance coverage average results

The proportion of children with health insurance was 23.4 per cent (95 per cent CI: 16.1-30.7 per cent) across Sudan. Northern state had the highest proportion of children with health insurance, while Al-Gazeera state had the lowest *(see Figure 425)*. More than 50 percent of children had health insurance coverage in only 2.2 per cent of localities.

Table 131 and Table 132 present results by locality, by state and at the national level for health insurance coverage of children.

FIGURE 425: Box plot of state and locality results for health insurance coverage

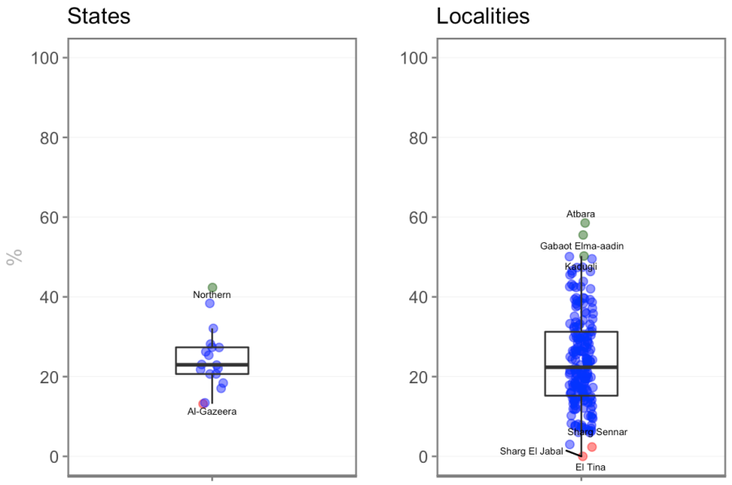


TABLE 131: Child has health insurance by state and national

Child has Health Insurance			
State	**Estimate**	**95% LCL**	**95% UCL**
Al-Gadarif	28.17	20.53	35.80
Al-Gazeera	13.18	7.09	19.27
Blue Nile	17.06	11.67	22.45
Central Darfur	25.36	16.57	34.15
East Darfur	21.74	13.12	30.35
Kassala	27.32	19.45	35.18
Khartoum	23.04	15.91	30.16
North Darfur	22.08	15.47	28.70
North Kordofan	32.10	24.31	39.90
Northern	42.36	34.79	49.92

TABLE 131: Child has health insurance by state and national

Child has Health Insurance			
State	**Estimate**	**95% LCL**	**95% UCL**
Red Sea	38.39	26.96	49.81
River Nile	26.24	20.10	32.39
Sennar	13.42	8.46	18.38
South Darfur	22.90	15.96	29.84
South Kordofan	20.66	14.60	26.71
West Darfur	27.36	19.15	35.57
West Kordofan	20.66	13.77	27.55
White Nile	18.41	11.90	24.91
Sudan	23.12	15.88	30.36

TABLE 132: Child has health insurance by locality and by state

Child has Health Insurance			
Location	**Estimate**	**95% LCL**	**95% UCL**
Dongola	46.88	40.03	53.30
El Golid	45.06	38.10	53.62
Merwoe	38.23	32.96	45.55
El Daba	42.64	33.38	50.17
Halfa	43.61	36.37	50.38
Delgo	39.08	32.62	46.04
El Burgaig	39.48	32.16	46.70
Northern State	42.36	34.79	49.92
El Matama	20.00	13.46	26.51
Shendi	17.13	11.61	22.94
Abu Hamad	11.45	6.02	17.66
Barbar	12.75	7.27	19.79
El Damar	36.71	31.65	42.18
Atbara	55.63	48.01	62.93
El Buhaira	37.42	30.78	43.89
River Nile State	26.24	20.10	32.39
Khartoum	31.25	24.69	38.21
Bahri	37.91	29.76	46.28
Um Durman	26.71	20.17	34.47
Um Bada	15.81	7.86	24.28
Jebel Awlia	18.42	13.13	23.73
Sharg Elneel	20.84	15.06	26.02
Karrari	19.46	14.32	26.40

TABLE 132: Child has health insurance by locality and by state

Child has Health Insurance			
Location	**Estimate**	**95% LCL**	**95% UCL**
Khartoum State	23.04	15.91	30.16
Greater Medani	27.16	20.54	33.91
Ganub Elgazira	21.45	12.06	31.99
El Hassahisa	10.59	6.11	16.70
El Kamlin	14.26	10.98	18.96
Sharg El Gezira	8.03	3.56	13.49
Um Elqura	9.81	5.38	15.65
El Manaqil	10.32	6.82	14.11
El Qurashi	6.84	2.83	11.74
Al-Gazeera State	13.18	7.09	19.27
Sennar	13.71	9.45	18.42
Sharg Sennar	3.29	0.67	6.67
Sinja	30.83	24.46	37.04
Abu Hujar	8.92	4.34	14.54
El Dali	16.20	10.30	24.08
Es Suki	17.68	13.06	23.16
Ed Dinder	8.97	5.84	12.83
Sennar State	13.42	8.46	18.38
Ed Damazine	32.20	25.82	37.84
El Tadamon	7.87	4.54	12.02
El Roseiris	24.16	19.67	28.64
Baw	5.88	3.51	8.56
Geisan	13.75	7.64	21.26
El Kurmuk	2.80	0.00	9.32
Wad El Mahi	11.19	7.30	15.56
Blue Nile State	17.06	11.67	22.45
Kosti	26.87	20.38	33.98
Guli	17.14	10.73	24.65
Tendalti	11.27	6.30	16.82
Es Salam	15.87	9.79	23.04
Rabak	18.81	15.09	22.62
El Jabalain	25.48	17.29	35.44
El Diwaim	8.01	4.46	13.24
Um Rimta	9.24	3.46	16.70
El Gitaina	21.49	14.84	28.78
White Nile State	18.41	11.90	24.91
Port Sudan	46.61	38.45	56.31
Swakin	35.14	25.61	46.61
El Gonob Welawlaib	58.17	47.63	66.16
Sinkat	37.93	27.85	47.76

TABLE 132: Child has health insurance by locality and by state

Child has Health Insurance			
Location	**Estimate**	**95% LCL**	**95% UCL**
Haya	34.08	19.93	46.20
Dordieb	42.83	27.78	56.10
Tokar	25.08	14.62	36.87
Agig	27.44	19.75	36.51
Gabaot Elma-aadin	56.22	49.87	61.14
Halaeeb (accessible parts)	30.43	19.61	46.72
Red Sea State	38.39	26.96	49.81
Kassala Town	43.89	37.08	50.23
Refi Kassla	30.05	23.07	37.26
Rural Western Kassala	23.55	16.05	30.82
New Halfa	22.26	15.25	28.06
Refi Nahr Atbara	14.57	9.58	20.18
Rural Khashm Elgirba	20.19	10.81	32.10
Rural Wad Elhilaiw	36.15	28.77	44.60
Rural Aroma	6.68	2.25	11.96
Refi North Delta	38.67	29.00	48.52
Refi Hamashkureib	27.60	18.89	34.76
Rural Telkok	21.40	13.39	30.95
Kassala State	27.32	19.45	35.18
Gedaref Town	39.88	33.84	48.02
Middle Geddaref	42.52	29.57	56.60
Elbutana	22.73	16.34	29.66
El Fashaga	12.39	7.40	18.55
El Rahad	19.27	10.72	27.63
Gala-a El Nahal	25.48	20.46	31.71
El Fao	21.60	17.73	26.88
El Qureisha	38.34	28.59	46.94
El Mafaza	39.17	29.57	47.63
Basunda	20.59	17.02	24.90
Western Galabat	15.73	11.26	20.41
Eastern Galabat	28.38	21.92	34.70
Al-Gadarif State	28.17	20.53	35.80
Sheikan	40.46	35.87	45.70
Um Rawaba	31.94	26.75	37.38
Um Dam Haj Ahmed	37.37	26.12	48.76
El Rahad	24.32	15.43	33.79
Bara	36.54	25.97	45.16
Gharb Bara	31.13	18.94	45.70
Soudari	20.33	12.83	27.29

TABLE 132: Child has health insurance by locality and by state

Location	Child has Health Insurance		
	Estimate	95% LCL	95% UCL
Gebrat El Sheikh	23.00	15.80	30.85
North Kordofan State	32.10	24.31	39.90
Kadugli	50.57	45.79	56.30
Reif Shargi	28.44	22.76	34.17
Dilling	32.07	26.20	38.30
El Quoz	18.81	14.41	22.99
Habila	22.16	16.17	27.62
Abassiya	13.45	9.57	17.61
El Rashad	28.03	21.46	34.29
Abu Jubaiha	5.11	2.74	7.56
El Tadamon	8.08	5.10	11.89
Talodi	29.96	16.08	46.99
Ghadeer	20.61	12.90	30.64
El Leri	26.97	19.63	34.91
Abu Karshola	14.01	7.77	20.89
Delami	26.67	17.91	35.46
South Kordofan State	20.66	14.60	26.71
Abu Zabad	27.35	20.41	34.18
ElKhiwai	30.45	17.88	45.41
Ghubaish	22.18	16.76	27.35
El Nuhud	12.97	9.32	16.63
El Idia	27.20	20.08	33.09
Wad Benda	14.60	9.65	20.97
Lagawa	15.72	9.80	21.44
Elsunut	13.83	8.89	20.19
Keilik	30.57	21.60	39.77
Es Salam	37.99	32.05	44.70
Babanusa	20.83	16.94	25.95
Abyei	16.93	13.49	20.55
El Dibab	23.28	9.90	35.83
El Meiram	15.58	9.32	22.93
West Kordofan State	20.66	13.77	27.55
El Fasher	30.24	25.18	34.83
Tawila	6.30	3.35	10.35
Melit	20.58	11.40	29.21
Um Kadada	29.76	23.04	36.70
Kebkabiya	36.30	28.65	44.84
Kutum	28.83	20.26	36.83
El Mahalha	12.33	7.63	18.83
Saraf Omra	14.58	9.24	21.71
El Serief	17.80	14.46	23.05

TABLE 132: Child has health insurance by locality and by state

Location	Child has Health Insurance		
	Estimate	95% LCL	95% UCL
Dar Elsalam	22.79	13.64	33.28
Kelemando	17.38	13.29	21.16
El Tawisha	14.97	10.93	19.36
Um Baru	7.53	4.03	10.75
El Lait	22.62	16.50	28.56
ELkuma	25.09	11.69	36.53
El Tina	0.00	0.00	0.00
Kernoi	23.41	19.08	28.33
North Darfur State	22.08	15.47	28.70
Nyala South	24.45	20.21	29.31
Nyala North	22.16	15.07	30.19
Es Salam	16.20	12.33	21.05
El Wihda	19.09	13.09	26.71
Mershing	11.76	7.37	15.82
Beliel	18.45	14.75	21.83
Nitega	26.73	20.82	32.94
Sharg El Jabal (accessible parts)	0.00	0.00	0.00
Kas	22.96	17.11	28.90
Shattaya	30.10	26.06	34.01
Buram	14.52	9.04	20.64
Gereida	26.17	20.67	31.88
El Sunta	21.09	12.70	30.11
El Radoum	17.52	9.75	26.50
Tulus	37.07	27.92	45.50
Damso	31.65	23.17	40.62
Ed Elfursan	13.20	7.59	19.85
Kubum	21.97	14.74	32.09
Kateila	16.96	12.59	21.65
Rehaid Elbirdi	27.13	20.36	34.18
Um Dafoug	18.40	9.11	27.25
South Darfur State	22.90	15.96	29.84
Abu Jabra	18.66	9.74	28.21
Abu Karinka	36.21	27.58	45.12
Bahr El Arab	14.66	6.73	24.47
Adila	22.89	13.71	32.10
Ed Dain	33.71	27.91	40.63
Assalaya	9.65	5.91	14.19
El Firdous	12.80	8.18	19.24
Shia-ria	33.22	22.31	43.92
Yassin	15.53	8.87	22.65

TABLE 132: Child has health insurance by locality and by state

Child has Health Insurance			
Location	**Estimate**	**95% LCL**	**95% UCL**
East Darfur State	21.74	13.12	30.35
El Geneina	29.70	22.85	35.77
Habila	23.77	16.46	32.42
Kulbus	38.44	28.49	47.99
Beida	19.43	11.27	28.94
Foro Baranga	27.08	19.19	36.05
Kereneik	17.09	13.77	21.14
Sirba	24.62	16.61	33.94
Jebel Moon	33.29	22.43	43.80
West Darfur State	27.36	19.15	35.57
Zalingi	37.10	31.81	42.32
Wadi Salih	20.89	12.81	31.21
Mukjar	6.44	3.60	9.57
Central Jebel Mara	48.56	39.47	60.42
North Jebel Mara	9.71	1.41	21.35
Bendasi	30.02	14.18	43.35
Nertiti	48.51	41.89	54.72
Azum	40.86	29.71	49.47
Um Dukhun	6.64	3.65	10.92
Central Darfur State	25.36	16.57	34.15

Spatial distribution of health insurance coverage

Low insurance coverage was evenly spread throughout Sudan, with a few small areas of high coverage in Red Sea state and Northern state *(see Figure 426)*.

FIGURE 426:
Child: Child has health insurance (raster)

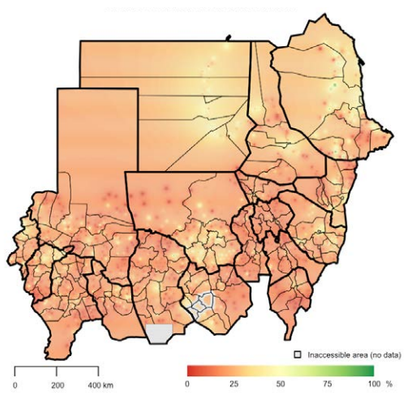
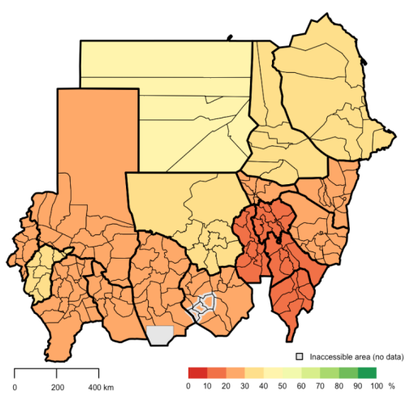


FIGURE 427:
Child: Child has health insurance



CHAPTER 4

CONCLUSION

4. CONCLUSION

4.1 Child nutrition status

Stunting, or low height for age, is the consequence of prolonged undernutrition and can be exacerbated by recurrent episodes of disease. Stunting affects a child's physical and mental development. The results showed that 36.4 per cent of children under 5 years of age were stunted in the S3M II survey, compared with 38.2 per cent in 2014 Multiple Indicator Cluster Survey (MICS). The results from S3M I showed that 130 out of 173 localities had a stunting rate above 30 per cent, while 161 localities (93 per cent) had a stunting rate above 20 per cent. In comparison, the new S3M II survey showed that 128 localities of the total 185 localities (69 per cent) had prevalence stunting rates greater than 30 per cent and 162 localities (88 per cent) had a stunting rate above 20 per cent. Moreover, 86 localities (46 per cent) had global stunting prevalence greater than 40 per cent in S3M II compared to 77 localities in S3M I. The survey showed that 29.2 per cent of children under 5 were moderately or severely underweight for their age, compared with 33.0 per cent in 2014 MICS. The survey also showed that 13.6 per cent of children under 5 were moderately or severely underweight for their height or suffering from wasting. This indicator, also referred to as global acute malnutrition (GAM), is used as a key indicator in assessing a population in humanitarian emergencies. Levels above 15 per cent are supposed to trigger a nutritional emergency. Although the prevention and treatment programmes were scaled up and expanded in Sudan previously, it is alarming that two out three indicators of child undernutrition (underweight prevalence and stunting) were above the emergency threshold in the S3M II survey. When compared with results from MICS 2014, these indicators show some improvement and some deterioration in different states and localities, pointing to an imminent nutritional crisis. Despite all the challenges the health system is facing, Sudan is one of the countries fighting malnutrition that has achieved some progress in reducing the problem's scope. The high prevalence of stunting reflects a lack of integrated long-term programming addressing the multi-sectoral underlying causes of malnutrition.

Regularly occurring droughts in the eastern and western states of Sudan contribute to inconsistent agricultural production and consequently to food scarcity. Additionally, prolonged conflicts in some localities and persistent economic challenges throughout the country have deeply impacted the level of food insecurity, leaving a number of people food insecure. Another important factor that needs to be considered is the seasonality of acute malnutrition in Sudan. The first phase of data collection occurred in September and overlapped with the lean season. At that time, nine states were surveyed: North Darfur, East Darfur, West Kordofan, River Nile, Sennar, South Darfur, North Kordofan, Khartoum and Northern. The survey showed that levels of wasting (low weight for height Z-score or WHZ, as well as MUAC) were relatively more pronounced in those nine states than in the phase two states where data was collected in November-December. Unlike famine, hunger gaps tend to be cyclical and therefore predictable; they typically occur between harvest seasons, when the previous year's food stocks have diminished, food prices are high and income is scarce.

4.2 Childhood anaemia

Anaemia is defined as decreased haemoglobin concentration in the blood. Iron deficiency is estimated to contribute to approximately half of all anaemia cases worldwide. Iron-deficiency anaemia can also result from a deficiency of folate (vitamin B9), vitamin B12 or vitamin A. Non-nutritional causes- such as blood disorders, malaria and other helminths- can also be responsible for the development of anaemia. Anaemia impairs a child's physical and cognitive development, increases susceptibility to infections and results in fatigue. Anaemia also increases the risk of child morbidity and mortality.

The results of the S3M II survey showed that the prevalence of anaemia among children under 5 in Sudan was 48.09 per cent, predominantly through cases of mild anaemia. Low consumption of vitamin

B-rich foods (B12, B9), low consumption of iron-rich foods (animal sources in particular), poor immunity, poor hygiene, malnutrition, and infestations (helminths) could account for most of the anaemia cases in the current country's setting.

4.3 Infant and young child feeding (IYCF)

Breastfeeding is an unrivalled way of providing ideal food for the healthy growth and development of an infant; it is also an integral part of the reproductive process with important implications for the health of mothers. Inadequate breastfeeding practices contribute to child malnutrition either directly or via disease. WHO/UNICEF guidelines call for: 1) initiation of breastfeeding within one hour of birth; 2) exclusive breastfeeding, with no other fluids added except for medical purposes, from birth up to 6 months; and 3) continued breastfeeding together with appropriate complimentary foods up to two-years-old and beyond. According to S3M II results, 62.3 per cent of babies were exclusively breastfed for 6 months, which was an improvement when compared with the 2014 MICS survey results that showed 55.4 per cent. Regarding infant and young child (6-23 months) feeding practices, only 25.4 per cent of all children met minimum dietary diversity guidelines, and only 63.2 per cent met minimum meal frequency guidelines. Feeding practices are linked to the level of the mother's education and socioeconomic status, suggesting that poor feeding practices are closely linked to low education and knowledge as well as low income.

4.4 Coverage of growth monitoring program (GMP) and screening using mid-upper-arm circumference (MUAC) and infant and young child feeding (IYCF) counseling

The government has implemented GMP services and screening for acute undernutrition cases using MUAC in order to improve child nutritional status. Although several efforts had been made to promote child growth, both at the health institutions and grassroots levels, the GMP coverage was only 7.6 per cent, far below desired levels. Coverage of IYCF counseling and messages fared better, though it was still below a minimum 50 per cent, with a coverage of 38.4 per cent. The prevalence of malnutrition was also still high among children under 5.

4.5 Child vitamin A supplementation coverage

Vitamin A plays an indispensable role in a child's health. Vitamin A deficiency can cause severe visual impairment and blindness and significantly increases the risk of severe illness and death from common childhood infections, including diarrhoea and measles. Despite the Sudanese government's integrated strategies to deliver vitamin A supplements to all parts of the country, and the bi-annual vitamin A supplementation campaigns, the coverage of vitamin A supplementation was still far below the target of 95 per cent set by MOH/WHO. The *S3M II* survey report indicated that only 39.8 per cent of children under 5 years received vitamin A supplementation. Meanwhile, while some states made a significant improvement in terms of coverage (e.g., South Kordofan state), other states had a significant drop (e.g., River Nile state). Possible reasons for this subpar performance include partial promotion campaigns in the last three years and inadequate supply and distribution of vitamin A supplements. Measures are needed to avoid recurrent relapses in coverage.

4.6 Maternal nutrition

Maternal nutrition status is an important predictor of birth outcome, particularly low birth weight (LBW). There was a high prevalence of GAM among women of reproductive age (15-49 years of age), with an

average of 8.63 per cent (MAM 6.36 per cent and SAM 2.18 per cent). Red Sea state had a significantly higher prevalence of GAM among women of reproductive age.

4.7 Women's diets

Standard diet diversity recommendations are achieved when a household consumes at least 5 out of 12 food groups, while the recommended minimum is 3 consumed food groups. The S3M II survey captured 17 food groups with detailed data, especially for fruits and vegetables. Results illustrate that at the national level, the estimated maternal dietary diversity and the number of mothers who achieved the minimum score were low, much lower than the thresholds of the Integrated Food Security Phase Classification (IPC). The low maternal dietary diversity found in the S3M II survey in some states indicated that these states faced chronic food insecurity caused by drought, conflict and poorly informed dietary choices.

4.8 Salt iodization

Iodized salt is used to prevent iodine deficiency disorders (IDDs), a condition that causes brain damage and can lead to a series of other health complications. Such complications include the following: mental retardation and impaired psychomotor development in young children (contributing to poor school performance); reduced intellectual ability; impaired work performance; cretinism (severely stunted mental and physical growth); goiter; and pregnancy-related complications. The WHO-recommended target of 90 per cent iodized salt utilization is far from the reality in Sudan. The S3M II survey results showed that utilization of adequately iodized salt among households was very low at only 3.2 per cent, and that it had fallen even further since the previous survey.

4.9 Female genital mutilation (FGM)

Sudan is a country where FGM is still practiced. The prevalence of FGM among carers was higher compared with the prevalence among girls up to the age of 14 years. North Kordofan state showed the highest proportion of carers who experienced FGM at different ages, and Red Sea state showed the highest proportion of girls who experienced FGM at different ages

4.10 Childhood illnesses and treatment-seeking behaviour

Diarrhoea, fever and cough with difficult breathing are common danger signs recognized worldwide for children under 5 years of age and for which caregivers are encouraged to recognize and bring in for treatment.

In many localities in Sudan where high prevalence of diarrhoea was reported in the S3M II survey, a high prevalence of severe acute malnutrition has also been noted, which may be one cause of diarrhoea or vice-versa. Other factors that may contribute to diarrhoea were the high prevalence of acute respiratory infection, fever, poor hygiene practices and poor health-seeking behaviour. Other factors believed to contribute to an increased prevalence of diarrhea include the following: lack of sanitation; drinking water from non-improved sources compounded by non-sanitary disposal of children's feces; and poor knowledge of diarrhoea treatment. Illness (specifically diarrhoea and fever) is one of the immediate causes of malnutrition and has been shown to be an important cause of severe acute malnutrition in Sudan. These findings underscore the importance of programming that focuses on integrated health, nutrition, and water, sanitation and hygiene (WASH).

4.11 Antenatal (ANC) and postnatal care coverage

The goal of antenatal care is to have a healthy mother and a healthy baby by monitoring the well-being of both the woman and the fetus during pregnancy and then helping them make a smooth transition to labour and delivery. ANC visits also provide opportunities for a woman to learn the danger signs that may occur during pregnancy, delivery or in the postnatal period. During the ANC visits, a woman can also be immunized against tetanus, learn about infant care and birth spacing (family planning), and receive treatment for any existing health issue, such as anaemia. Quality ANC can contribute to the prevention of maternal and newborn morbidity and mortality by detecting and managing potential complications and risk factors, including pre-eclampsia, anaemia, malaria, sexually transmitted diseases and HIV/AIDS. The provision of ANC services is critical in achieving these goals.

In Sudan, the current approach to the provision of ANC services recommends at least four ANC visits that provide essential, evidence-based intervention, a package called focused antenatal care (FANC). The four-visit ANC coverage indicator- along with iron and folic acid supplementation- are the closest proxies for assessing FANC coverage. Ideally, pregnant women should make their first ANC visit before 12 weeks of pregnancy. At that point, interventions such as iron-folic acid supplementation can be started - if they were not begun earlier. As well, an early maternal health assessment can be given to detect any potential health issues for the mother and the fetus and offer them the best possible preventative and therapeutic benefits. The S3M II survey results highlight the fact that pregnant women in Sudan started attending ANC slightly later than the ideal, at 3.4 months on average. Results also showed that on average, pregnant women attended 3.8 ANC visits, with only a little more than half (51.2 per cent) of women attending the recommended minimum of four ANC visits during their pregnancy. There was a worryingly high proportion of pregnant women who had never attended a single ANC session during their pregnancies, with an overall non-attendance rate of 16.2 per cent. And 16 localities had a non-attendance rate of over 40 per cent. Failing to attend ANC visits could be one of the contributing factors behind the low levels of iron and folic acid consumption during pregnancy.

There was also a high level of variability of ANC coverage across different states and localities. Parts of Sudan are sparsely population and feature harsh environmental conditions. Effective service delivery is, therefore, challenged by the poor and limited infrastructure that connects far-flung communities. In addition, the number of ANC visits is highly associated with socioeconomic status, as suggested by the marked variations that are seen between urban and rural areas. Households with moderate-to-high income seem to make more ANC visits, while those with low incomes make fewer visits. This suggests that poverty is one of the main contributing factors to poor adherence to ANC visit recommendations and the use of ANC services. Furthermore, those areas with the lowest attendance at ANC visits, including Sharg El Jabal (accessible parts) in South Darfur State and North Jebel Mara in Central Darfur State, are conflict-affected areas, which could explain the poor access to health service. The survey also found that the decision of whether to attend a health service is influenced by four main factors: sociocultural; perceived benefit and need; economic; and physical accessibility. Utilization of health facilities for childbirth was still low and with marked variations between urban and rural areas. Understanding the reasons behind the poor use of these services in a rural setting is important to design targeted strategies and address the challenge contextually. To increase health facility delivery, it is important to try some of the following: raise women's awareness on the benefits of delivering in health facility and the threats of delivering at home; involvement of men in the use of maternal health services; increase women's decision-making power; address common barriers of lack of transport; and shorten the distance to health facilities.

The postnatal period is considered a very critical period, as it is the time in which a majority of maternal and neonatal deaths occur. Health care during this period is essential to provide life-saving interventions for both mothers and newborns. The S3M II results indicated low coverage of postnatal care at 34.2 per cent for the whole of Sudan. At the state level, this ranged from 7.9 per cent to 64.7 percent. Maternal night blindness is an indicator of severe vitamin A deficiency. Gestational night

blindness is associated with increased risk of reproductive morbidity and mortality. From the S3M II survey report, the proportion of mothers with self-reported night-blindness was at 13 per cent, which significantly exceeds the threshold of 5 per cent above which the community is said to have a public health problem.

4.12 Antenatal iron and folic acid (IFA) supplementation

A growing fetus increases a pregnant woman's need for iron and folic acid. These increased demands cannot be met through a mother's balanced diet alone, so supplements of iron and folic acid must be provided. Across Sudan, pregnant women began taking iron and folic acid supplementation via an IFA tablet at 2.4 months gestation on average. In two states, Khartoum and Northern, the average supplementation is higher beginning at three months' gestation. The distribution pattern of IFA supplementation throughout the country follows that of antenatal care attendance, suggesting a clear link between the two indicators.

4.13 Postpartum care coverage

Low rates of postpartum care also result in poor postpartum vitamin A supplementation coverage, which subsequently contributes to the relatively high prevalence of self-reported night blindness found in the S3M II survey, particularly in the west and south of the country. Despite the low coverage of postpartum care, tetanus vaccination coverage among carers/mothers and pregnant women reached 67.3 per cent coverage, suggesting that postpartum women were vaccinated for tetanus outside of routine postnatal care or were being served through the various vaccination campaigns across the country.

4.14 Coverage of expanded programme on immunization (EPI)

The expanded programmeme on immunization (EPI) forms the foundation of global public health action for child survival and disease prevention. Achieving a high EPI coverage level is important in ensuring programme effectiveness. In Sudan, a child is vaccinated against tuberculosis (BCG) at birth. The child also receives three doses of pentavalent vaccine and three doses of oral polio vaccine before 6 months, and measles at 9 months. The availability of a child vaccination card and BCG coverage are good proxies for initial access or contact to EPI services. The S3M II survey results showed that around 61.7 per cent of children under 2 years had a vaccination card, though only around 26.7 per cent of children received the full package of EPI immunizations as recommended. However, the specific rate of BCG vaccination was high and had improved significantly since last survey, from 61.1 per cent to 77.6 percent. Regarding the pentavalent, polio and measles vaccinations, a fairly high adherence was achieved for the first doses. However, the numbers dropped off significantly for subsequent doses, and defaulters who failed to complete the full course of doses likely will lack adequate immune responses to protect them from these diseases.

4.15 Coverage of insecticide-treated nets (ITNs)

Sudan is in a malaria-endemic region, and the disease leads to 35,000 deaths annually across the country. Control measures currently focus on promoting the use of insectide-treated nets or ITNs, to reduce contact between mosquitoes and humans, along with environmental management actions led by the government and local communities to reduce the population of mosquitoes, which serve as disease vectors. ITNs are the first-line preventive measure. The S3M II survey reported the highest prevalence of ITNs in the parts of the country experiencing the heaviest rainfalls. High rainfall often results in pools of stagnant water, which act as breeding grounds for mosquitoes and

contribute to additional cases of malaria (along with chikungunya, dengue, rift valley fever and other mosquito-borne illnesses). High ITN utilization rates in these high-rainfall areas could be the result of preventive measures or an emergency response. Continuous campaigns are needed not only to educate communities about the several benefits of using ITNs (focusing particularly on children and pregnant women) but also to decrease the likelihood of relapses in utilization rates. Vector control measures (large and small scale) involve actions from both the government as well as the community.

4.16 Time to health facility

Time needed to reach a health facility reflects the accessibility of these facilities. The distance that patients must travel to obtain treatment is the primary determinant of the extent to which health care facilities are used. Despite the primary health care (PHC) expansion programme in Sudan that had set its primary goal as improving and expanding access to a health facility, it was found that most of the facilities were non-functional. On average in the S3M II survey, caregivers needed at least 30 minutes to reach the nearest available health facility. In rural areas where the housing density is lower, the average time to reach a health facility could range from one hour to two hours.

4.17 Coping strategies index (CSI)

The coping strategies index (CSI), a tool developed by the World Food Program, is commonly used as a proxy indicator for access to food. It is a weighted score that allows measurement of the frequency and severity of coping strategies. This indicator is used when certain hazards occur that may negatively impact food or income sources. The S3M II survey report showed a low CSI index throughout Sudan with a few small areas of moderate to high CSI scores. The low CSI scores indicate that the majority of households in Sudan were food insecure.

4.18 Health and nutrition information awareness and access

Unlike the S3M I survey, the S3M II survey included a new, important indicator: awareness of CMAM programmes. The results showed that there was generally poor knowledge of acute malnutrition (GAM) across the country. Among caretakers, only about 53.7 per cent were aware of the CMAM programme. Across different localities, the level of awareness ranged from zero awareness to high awareness. Inter-state differences seemed to be generally dictated by the intensity of health and nutrition programming, which tends to peak when there is an urgent need requiring an acute response, for example a humanitarian emergency.

4.19 Health and nutrition messaging and communication channels/medium

Outreach workers were by far the most preferred channel for health and nutrition messaging, with radio and television respectively following as the second and third choices. This points to the importance of direct human contact and engagement when spreading health and nutrition information and suggests that the number of outreach workers should be increased. Disseminating health messages through outreach workers also gives communities an opportunity to have questions answered and clarified immediately. National Sudan TV and national radio were the most preferred TV and radio stations. Mornings and evenings time were the preferred times of the day for health and nutrition messages. As the government or other stakeholders plan future messaging campaigns, these preferences should be taken into account to maximize the effectiveness of the messaging.

4.20 Water, sanitation and hygiene (WASH)

Universal, affordable and sustainable access to clean drinking water plus adequate sanitation and hygiene are key public health issues within international development and are the focus of the United Nations' Sustainable Development Goal 6. The lack of safe WASH services disproportionately affects populations living in sub-Saharan Africa and central/southern Asia. In sub-Saharan Africa particularly, the death rates owing to unsafe WASH services were 46 per 100,000 people[50]. The S3M II survey results highlighted the many problems with WASH in Sudan that likely contributed to the country's major difficulties battling infectious diseases. For example, 83.03 per cent of the population had access to improved drinking water, while only 73.73 per cent had access to improved drinking water within 30 minutes. Only 37.4 per cent of the population could access improved toilet facilities, while only 14.3 per cent could access hand-washing facilities. Furthermore, the average caregiver was aware of only 2.4 important hand-washing events out of 5. Raising awareness of hygiene practices, as well as providing these essential facilities, is crucial. In addition, several studies suggest that available, accessible hygiene facilities can have a tremendous positive effect on overall healthy behaviours.

4.21 Child protection

The S3M II survey found that almost half of the under-five-year-old children were not registered at birth, indicating that they were deprived of identity and official nationality. Registering children at birth is the first step in securing their recognition before the law, therefore, safeguarding their rights. And it is essential for a sound economy and the social planning of a nation. It is important to develop and expand systems that ensure the registration of every child shortly after birth, as per law and relevant international instruments.

Marriage before the age of 18 years is a reality for many young girls in Sudan. The driving forces for early marriage are not merely cultural but also socioeconomic, as marrying off a daughter is expected to relieve the parents of a financial burden. Child marriage is a violation of fundamental human rights, particularly the right to free and full consent to a marriage recognized in the Universal Declaration of Human Rights. It also compromises the development of girls and often results in early pregnancy and social isolation, with little education and poor vocational training reinforcing the gendered nature of poverty.

Among the various consequences of child marriage are:

- Higher risk of sexually transmitted infection (HIV, Hepatitis B, C and others), which affects the health and future of a mother and her children
- Higher parity rate, which implies more financial cost or increased poverty rates
- Higher pregnancy-related complications, which can lead to death

A holistic approach is needed to stop early marriage, taking into account cultural aspects and all the driving forces linked to the phenomena.

[50] United Nations Report of the Secretary-General, 'Progress towards the Sustainable Development Goals', Progress of Goal 3 in 2017, [(accessed on 14 January 2018)]; Available online: https://sustainabledevelopment.un.org/sdg3.

4.22 Child health insurance

According to S3M II survey results, only one in four children under five-years-old was covered by health insurance. Despite available government and private health insurance in Sudan, the country is still far from achieving universal coverage by 2020. Moreover, the sustainability of health insurance is questionable. The main reasons include low government financial resources and a lack of affordability by beneficiaries.

4.23 Recognition of danger signs

Early recognition and timely management of most health conditions can reduce complications due to disease and can save lives. The survey reports that among caregivers, there is poor general knowledge about common health threats to children. Carers were only able to identify 1.7 danger signs out of 5. Fever was the most commonly identified danger sign. There is an urgent need to strengthen the awareness and education of carers to recognize danger signs in children and the most appropriate measures to take when they occur.

CHAPTER 5

RECOMMENDATIONS

5. RECOMMENDATIONS

5.1 Mother and child health and nutrition

- Expand growth monitoring programme (GMP) and IYCF counseling activities, with more focus on the eastern states.
- Strengthen routine nutritional screening activities through community-based mechanisms and conduct a MUAC screening campaign quarterly or biannually.
- Strengthen linkages between the IYCF and CMAM programmes through the involvement of mother support groups in screening, offering referrals, following-up with defaulters and reporting on progress.
- Redistribute and retarget resources, prioritizing areas of high need that currently have low CMAM awareness and high levels of stunting, underweight prevalence and wasting.
- Reinforce nutrition information systems, through the effective use of media platforms, to provide updated, accurate and continuous information about the nutritional status of communities.
- Plan, design and implement integrated, long-term, multi-sectoral programmes focusing on the first 1,000 days after birth as the great window of opportunity to break the intergenerational effects of malnutrition.
- Establish linkages between CMAM programme components and other existing livelihood projects, safety nets, and food security-related interventions that target children and mothers who face malnutrition.
- Strengthen linkages with reproductive health care services to address malnutrition among pregnant and lactating women and for all female carers.
- Establish and scale-up adolescent nutrition-related interventions (including micronutrient supplementation, deworming and raising awareness) at community and school levels through engagement of community leaders and teachers.
- Conduct an in-depth study to identify the causes of disparities in the measures of MUAC against WHZ measurements when assessing child nutrition status.
- Work with community leaders and through local activities to find and refer for help children younger than 5 and pregnant and lactating women experiencing malnutrition.
- Develop a joint CMAM scale-up plan to deliver an integrated package of services for children and mothers to address acute malnutrition, using the *S3M II* results and with a special focus on the geographic areas with higher needs.
- Conduct annual evaluations of all interventions with national and international partners to reform and reprogramme as necessary, especially for the CMAM and micronutrient interventions.
- Conduct awareness-raising campaigns with clear, comprehensive messages on child health and nutrition.
- Conduct capacity-building sessions for the staff working in nutrition at all levels (federal, state, locality and health-facility levels).
- Develop an active nutrition surveillance system for all localities.
- Run educational programmes on maternal health and nutrition as well as family planning (with a focus on health benefits).
- Establish a centre of excellence for malnutrition management of severe acute malnutrition and use it as a training centre.

5.2 Expanded programme on immunization (EPI)

- Expand mobile EPI services to access most remote areas of the country.
- Increase vaccination coverage, prioritizing areas with the lowest degree of coverage (using data from the S3M II) through community mobilization and health education.
- Strengthen passive case-finding at the health facilities level through linkages between vaccinations, IMCI, and reproductive health departments with outpatient therapeutic programmes or targeted supplementary feeding programmes.
- Conduct targeted educational sessions of caregivers regarding benefits of the full EPI, its side effects and care.
- Involve caregivers in the decision regarding the appropriate time for vaccination.
- Ensure vaccine supplies are provided and EPI services are monitored.
- Continue with acceleration campaigns, especially in remote rural areas.

5.3 Water, sanitation and hygiene (WASH)

- Promote the provision of safe drinking water for all communities.
- Ensure that all schools have adequate, child-friendly water and sanitation facilities and hygiene education programmes.
- Provide advocacy and technical support for improving hygiene awareness and promoting behavior change through education on health and nutrition as well as young child survival and development programmes.
- Provide technical support for water quality in areas of water-safety planning, water-quality monitoring and quality mitigation programming.

5.4 Child protection and education

- Develop and expand systems that ensure the registration of every child shortly after birth, as per law and relevant international instruments.
- Establish and reinforce laws that prohibit child marriage.

CHAPTER 6

APPENDICES

6. APPENDICES

6.1 References

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6.2 S3M II Questionnaire

Includes every household from the random starting point that has one child or more aged between 0 and 59 months.

Code	Question	Answer options
IDs		
date	Date	
state	State	1-18 (for the states, please refer to the table of states and localities below)
locality	Locality	1-189 (for the localities, please refer to the table of states and localities below)
spid	Primary sampling unit	
hhid	HH ID	
v_name	Village name	
spt	Sample type	
pop	Population	
t_id	Team ID	
interviewer	Name of the interviewer	
interviewer_tel	Interviewer telephone	
s_v_name	Substitute village name	
latitude	Latitude:	
longitude	Longitude:	
distance	Distance from intended sample location in (KM)	
d_con	Consent	☐ 1. Yes ☐ 2. No
tel	Household phone number	

Code	Question	Answer options
d8	How many mothers live in the surveyed household?	Automatically calculated from the demography below.
d9	How many children 0-59 months live in the surveyed household?	
d10	How many children 0-17 years live in the surveyed household?	
d11	How many children 1-14 years live in the surveyed household?	
d12	How many girls 0-14years live in the surveyed household?	
d13	How many woman 15-49 years live in the surveyed household?	
d14	How many woman 15-19 years live in the surveyed household?	
DEMOGRAPHY AND EDUCATION		
d_id	ID Number	
d1	Name	
d2	Gender of (name)	☐ 1. Male ☐ 2. Female
d3	Age of (name) Record in completed years; if age is less than a year record 0	
bc	Does (child name) have a birth certificate? Ask to show	☐ 0. Yes (seen) ☐ 1. Yes (not seen) ☐ 2. No
br	Has (child name) birth been registered?	☐ 1. Yes ☐ 2. No ☐ 3. I don't know
d3_under5	Age of (child name) in months For children less than 5 years.	
d4	Is (name) a principal carer. Asked for any member taking care for one child or more	Listed for Digital Data Collection purposes

Code	Question	Answer options
d5	Have you ever been to school? Age 14 and above	☐ 1. Yes ☐ 2. No
d6_school	(If age is 6 -13 years) Are you currently in school?	☐ 1. Yes ☐ 2. No
d6_pre	(If age is 4 or 5 years) Are you currently in pre-school?	☐ 1. Yes ☐ 2. No
d7	If aged 6 – 13 years and not in school, what is the reason he/she is not in school? Tick the correct answer.	☐ 0. Mixed Education ☐ 1. No school ☐ 2. No toilets or water at school ☐ 3. Illness or disability ☐ 4. The school is far ☐ 5. Work ☐ 6. Early marriage ☐ 7. Displacement ☐ 8. School fees ☐ 9. Other (specify)
d7_other	Other	
HOUSEHOLD ROSTER WASH		
ws1	What is your main source of drinking water?	☐ 1. Water through a pipe into house/ tap water ☐ 2. Water through a pipe into the yard/ tap water ☐ 3. Public water pipe ☐ 4. Elevated tank, hand pump (Kharjaka) ☐ 5. Protected well ☐ 6. Filtered surface water/rivers, lakes, ponds ☐ 7. Trucked from protected sources (1, 2, 3, 4, 5) ☐ 8. Bottled water ☐ 9. Unfiltered surface water/river, lake, pond ☐ 10. Unprotected well ☐ 11. Trucked from unprotected sources (6, 9, 10)

Code	Question	Answer options
ws1_other	Other	
ws2	Means of transport of water	☐ 1. Car ☐ 2. On horse or donkey ☐ 3. On foot
ws3	What is the average time needed to bring water from a source outside the household? Record in minutes	
ws4	Toilet type	☐ 0. Drain to a public sewer ☐ 1. Drain to a public tank ☐ 2. Drain to a hole ☐ 3. Drain to another place ☐ 4. Drain to an unknown place ☐ 5. Improved latrine with ventilation ☐ 6. Latrine without a cover ☐ 7. Latrine with a cover ☐ 8. Brewing toilet ☐ 9. Bucket ☐ 10. Other ☐ 11. No toilet (open defecation)
ws4_other	Other	
ws5	How many households are using the same toilet?	
ws6	Can I see where you wash your hands inside the house/yard? (Available)	☐ 0. Available and seen ☐ 1. Not available ☐ 2. Not permitted to see
ws7	If hand-washing facility available, check if water is running/available?	☐ 0. Available ☐ 1. Not available
ws8	Check for available detergent	☐ 0. Soap available ☐ 1. Ashes available ☐ 2. None
FOOD SECURITY		
Fs_cs	In the past 7 days did you at any point lack food or money to buy food?	☐ 1. Yes ☐ 2. No

Code	Question	Answer options
Fs_cs1	If yes, has your household had to (put number of days) in the past 7 days	☐ 1. Rely on less preferred foods or less expensive foods?
Fs_cs2		☐ 2. Eat borrowed food or borrow money to buy food?
Fs_cs3		☐ 3. Rely on help from friends or relatives?
Fs_cs4		☐ 4. Limit/ reduce the portion of food?
Fs_cs5		☐ 5. Reduce consumption by adults in order for small children to eat?
Fs_cs6		☐ 6. Reduce the number of meals per day?
PC ROSTER PC_WASH		
pc_n	Are you a mother?	☐ 1. Yes ☐ 2. No
pc_ws	When do you usually wash hands? Select all that apply.	☐ A. After defecation ☐ B. After cleaning child ☐ C. Before eating ☐ D. Before feeding child ☐ E. Before cooking ☐ F. Other
pc_ws_other	Other	
HEALTH AND NUTRITION		
hn1	Mother's age	
hn2	Are you pregnant or lactating?	☐ 1. Pregnant ☐ 2. Lactating ☐ 3. Both ☐ 4. None
hn3	Measure mother's MUAC Record to nearest mm.	

Code	Question	Answer options
HEALTH BEHAVIOUR		
h_hb	What signs and symptoms in your child would make you seek advice or treatment from heath facility or health care provider? Tick the correct/ your answer.	☐ A. Refuses to feed or drink ☐ B. Convulsions ☐ C. Vomiting all they eat ☐ D. Bloody diarrhoea ☐ E. Fever ☐ F. Drowsy/ unconscious ☐ G. Become sicker ☐ H. Fast and difficult breathing ☐ I. Don't know ☐ J. Other
h_hb_other	Other	
HEALTH SERVICES		
h_hs1a	If yes, how much time is needed to reach the nearest health facility? (in minutes)	
h_hs1b	If no, is there any health worker in your area providing health services?	☐ A. CHW ☐ B. Community midwife ☐ C. Village midwife ☐ D. No medical staff ☐ E. Other (specify)
h_hs1b_other	Other	
h_hs2	Have you ever heard about Growth Monitoring Program (GMP)?	☐ 1. Yes ☐ 2. No
h_hs4	Have you heard about malnutrition treatment services for children and mothers?	☐ 1. Yes ☐ 2. No
HEALTH PROMOTION		
h_hp1	Have you ever received health and nutrition messages?	☐ 1. Yes ☐ 2. No

Code	Question	Answer options
h_hp2	What is your preferred medium/ source for health messages?	☐ A. Social media ☐ B. SMS/ phone ☐ C. Internet ☐ D. Outreach Volunteers ☐ E. Posters ☐ F. Radio ☐ G. TV ☐ H. Other
h_hp2_other	Other	
h_hp2a_tv	What is your most preferred TV channel?	☐ 1. National TV ☐ 2. State TV ☐ 3. Blue Nile TV ☐ 4. Sudania 24 ☐ 5. AlShorouq ☐ 6. UmDurman ☐ 7. Other
h_hp2a_tv_ other	Other	
h_hp2a_rd	What is your most preferred radio channel?	☐ 1. National Radio ☐ 2. State Radio ☐ 3. Albeit Al Sudani ☐ 4. Community Radio ☐ 5. Darfur Radio ☐ 6. Other
h_hp2a_rd_ other	Other	
h_hp2b	If 2 or 3, what is your favorite/preferred program?	☐ A. News ☐ B. Serial ☐ C. Talk shows ☐ D. Children programs ☐ E. Documentaries ☐ F. Other
h_hp2b_ Other	Other	

Code	Question	Answer options
h_hp2c	What is your preferred time for health messages?	☐ A. Morning ☐ B. Noon ☐ C. Evening ☐ D. Night
	REPRODUCTIVE AND POSTNATAL HEALTH	
h_rh1	During your last pregnancy, how many ANC sessions did you attend? Record the number of visits.	
h_rh2	What was the gestational age/month of pregnancy at your first ANC visit?	
h_rh3	Who provided your ANC services?	☐ 1. A doctor ☐ 2. A nurse ☐ 3. Trained midwife ☐ 4. TBA ☐ 5. Medical assistant ☐ 6. Health visitor ☐ 7. Other
h_rh3_other	Other	
h_rh4a	For how long (in months) did you take Fefol? Show Fefol capsules/package.	
h_rh5	Who assisted your delivery during your last pregnancy?	☐ 1. A doctor ☐ 2. A nurse ☐ 3. Trained midwife ☐ 4. TBA ☐ 5. Medical assistant ☐ 6. Health visitor ☐ 7. Other
h_rh5_other	Other	
h_rh6	Did you take vitamin A capsules during the first six months after delivery? Show capsules and package.	☐ 1. Yes ☐ 2. No ☐ 8. I don't know

Code	Question	Answer options
h_rh7	During your last pregnancy did you have any difficulty seeing at night/night blindness?	☐ 1. Yes ☐ 2. No ☐ 8. I don't know
POST NATAL CARE		
h_pc1	Within the first two days after delivering your last child, were you seen by a health care provider?	☐ 1. Yes ☐ 2. No ☐ 8. Don't remember
h_pc2	How many tetanus vaccine doses did you receive during this pregnancy?	
h_pc3	How many tetanus vaccine doses did you receive before this pregnancy?	
Salt iodization		
h_si	Can I take look/sample of the salt you use for cooking? Test salt	☐ 0. Not iodized ☐ 1. Less than 15ppm ☐ 2. More than 15ppm ☐ 3. No salt ☐ 4. Refuse to show/give
Mother's dietary diversity		
n_wdd_a	What did you eat in the past 24 hours? Please select all that apply	A. Cereals B. Roots and tubers C. Carrot/pumpkin D. Green leafy veg E. Any other veg F. Papaya/mango G. Other fruits H. Meat/chicken I. Offal J. Eggs K. Fish L. Nuts and seeds M. Legumes/pulses N. Dairy products O. Oil and fats P. Sugar/honey/candy Q. Soft drinks/tea/coffee
n_wdd_a1	A. Cereals	☐ 1. Yes ☐ 2. No
n_wdd_a2	B. Roots/tubers	☐ 1. Yes ☐ 2. No

Code	Question	Answer options
n_wdd_a3	C. Carrot/pumpkin	☐ 1. Yes ☐ 2. No
n_wdd_a4	D. Green leafy veg	☐ 1. Yes ☐ 2. No
n_wdd_a5	E. Any other veg	☐ 1. Yes ☐ 2. No
n_wdd_a6	F. Papaya/mango	☐ 1. Yes ☐ 2. No
n_wdd_a7	G. Other fruits	☐ 1. Yes ☐ 2. No
n_wdd_a8	H. Meat/chicken	☐ 1. Yes ☐ 2. No
n_wdd_a9	I. Offal	☐ 1. Yes ☐ 2. No
n_wdd_a10	J. Eggs	☐ 1. Yes ☐ 2. No
n_wdd_a11	K. Fish	☐ 1. Yes ☐ 2. No
n_wdd_a12	L. Legumes/pulses	☐ 1. Yes ☐ 2. No
n_wdd_a13	M. Nuts and seeds	☐ 1. Yes ☐ 2. No
n_wdd_a14	N. Dairy products	☐ 1. Yes ☐ 2. No
n_wdd_a15	O. Oil and fats	☐ 1. Yes ☐ 2. No
n_wdd_a16	P. Sugar/honey/candy	☐ 1. Yes ☐ 2. No
n_wdd_a17	Q. Soft drinks/tea/coffee	☐ 1. Yes ☐ 2. No

Code	Question	Answer options
n_wdd_b1	What is the source of your cereals?	☐ A. Own production (crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b2	What is the source of the roots and tubers?	☐ A. Own production (crop) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b3	What is the source of carrot/pumpkin?	☐ A. Own production (crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)

Code	Question	Answer options
n_wdd_b4	What is the source of green leafy vegetables?	☐ A. Own production (crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b5	What is the source of any other vegetables?	☐ A. Own production (crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (Food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b6	What is the source papaya/mango?	☐ A. Own production (crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)

Code	Question	Answer options
n_wdd_b7	What is the source of other fruits?	☐ A. Own production (animals and crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b8	What is the source of meat/chicken?	☐ A. Own production (animals) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b9	I. Offal	☐ A. Own production (animals and crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)

Code	Question	Answer options
n_wdd_b10	What is your source of eggs?	☐ A. Own production (animals) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b11	What is your source of fish?	☐ A. Own production ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b12	What is your source of legumes/pulses?	☐ A. Own production (crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)

Code	Question	Answer options
n_wdd_b13	What is your source of nuts and seeds?	☐ A. Own production (crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b14	What is your source of dairy products?	☐ A. Own production (animals and crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b15	What is your source of Oil and fats?	☐ A. Own production (animals and crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)

Code	Question	Answer options
n_wdd_b16	What is your source of sugar/honey/candy?	☐ A. Own production (animals and crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
n_wdd_b17	What is your source of soft drinks/tea/coffee?	☐ A. Own production (crops) ☐ B. Fishing / hunting ☐ C. Gathering ☐ D. Loan ☐ E. Market (cash) ☐ F. Market (credit) ☐ G. Beg for food ☐ H. Exchange labor/items for food ☐ I. Gift (food) from family/friends ☐ J. Food aid (NGOs, WFP)
CHILD MARRIAGE		
cc1	Are you currently married?	☐ 1. Yes ☐ 2. No
cc_ss	What is your marital/civil status?	☐ 1. Single ☐ 2. Divorced ☐ 3. Widow
cc2	How old were you when you first got married?	
cc3	How old were you when you first got pregnant?	
fgm	Have you been circumcised	☐ 1. Yes ☐ 2. No ☐ 7. Refuse to answer

Code	Question	Answer options
FEMALE GENITAL MUTILATION OF DAUGHTERS		
fgm_n	Name (anonymized for ethical reasons)	
circumcisee	Has (daughter name) been circumcised?	☐ 1. Yes ☐ 2. No ☐ 7. Refuse to answer
Pregnant women		
pw1	Name (anonymized for ethical reasons)	
pw5	Are you pregnant?	☐ 1. Yes ☐ 2. No ☐ 0. Not married
pw6	MUAC in mm	
CHILD		
ch_id	Child ID	
ch_n	Child name (anonymized for ethical reasons)	
ch_age	Child age. Record in months.	
ch_sex	Sex of child	☐ 1. Male ☐ 2. Female
ch_ins	Does (CHILD name) have health insurance?	☐ 1. Yes ☐ 2. No ☐ 8. Don't know
ch_ant1	MUAC (to the nearest mm) Record for children 0-59 months If <115mm refer to nearest OTP / HC. If <125mm refer to SFP / HC.	☐ Record MUAC ☐ 998. Refused ☐ 997. Child absent
ch_ant11	Was this measurement (MUAC) taken for (CHILD name)?	☐ 1. Yes ☐ 2. No ☐ 8. Don't know
ch_ant12	How many months ago was the last time when (MUAC) was taken for (CHILD name)?	

Code	Question	Answer options
ch_ant2	Measure WEIGHT of (CHILD name) (to the nearest kg)	☐ Record weight ☐ 98. Refused ☐ 97. Child absent
ch_ant2_1	How many times these measurement (weight) were taken for (CHILD name) in the health facility?	
ch_ant3	Measure HEIGHT of child (record to the nearest mm)	☐ Record MUAC ☐ 998. Refused ☐ 997. Child absent
ch_ant3_1	Did you receive counselling about how to feed (CHILD name)?	☐ 1. Yes ☐ 2. No ☐ 8. Don't know
ch_ant4	Bi-lateral ODEMA? If yes refer to nearest OTP / HC	☐ 1. Yes ☐ 2. No ☐ 8. Don't know ☐ 7. Absent
ch_dis	In the last 2 weeks has this child suffered from:	☐ A. Diarrhoea ☐ B. Cough with difficult breathing ☐ C. Fever ☐ D. Not sick ☐ Don't know
ch_ts1	During the last episode of diarrhoea, did you seek advice or treatment from heath facility or provider?	☐ 1. Yes ☐ 2. No ☐ 8. Don't know
ch_ts2	During the last episode of diarrhoea, what did you treat (CHILD name) with?	☐ A. ORS packets ☐ B. ORS packets with zinc supplements ☐ C. Zinc supplements ☐ D. Nothing ☐ E. Other ☐ F. Don't know
ch_ts2_other	Other	

Code	Question	Answer options
ch_ts3	During the last episode of cough with difficult breathing, did you seek advice or treatment from heath facility or provider?	☐ 1. Yes ☐ 2. No ☐ 8. Don't know
ch_ts4	During the last episode of cough with difficult breathing, did you give (CHILD name) antibiotic?	☐ 1. Yes ☐ 2. No ☐ 8. Don't know
ch_itn	Did (CHILD name) sleep under an ITN last night?	☐ 1. Yes ☐ 2. No ☐ 3. Less protected type ☐ 8. I don't know
Has the child received the following vaccinations (ask to see vaccination card)?		
ch_imm1	BCG (scar)	☐ 1. YES with card ☐ 2. YES without card ☐ 3. No ☐ 8. Don't know ☐ 9. Not applicable
ch_imm2	DPT1 + Hib1 + HepB1	☐ 1. YES with card ☐ 2. YES without card ☐ 3. No ☐ 8. Don't know ☐ 9. Not applicable
ch_imm3	DPT2 + Hib2 + HepB2	☐ 1. YES with card ☐ 2. YES without card ☐ 3. No ☐ 8. Don't know ☐ 9. Not applicable
ch_imm4	DPT3 + Hib3 + HepB3	☐ 1. YES with card ☐ 2. YES without card ☐ 3. No ☐ 8. Don't know ☐ 9. Not applicable

Code	Question	Answer options
ch_imm5	OPV1	☐ 1. YES with card ☐ 2. YES without card ☐ 3. No ☐ 8. Don't know ☐ 9. Not applicable
ch_imm6	OPV2	☐ 1. YES with card ☐ 2. YES without card ☐ 3. No ☐ 8. Don't know ☐ 9. Not applicable
ch_imm7	OPV3	☐ 1. YES with card ☐ 2. YES without card ☐ 3. No ☐ 8. Don't know ☐ 9. Not applicable
ch_imm8	Measles 1	☐ 1. YES with card ☐ 2. YES without card ☐ 3. No ☐ 8. Don't know ☐ 9. Not applicable
ch_imm9	Measles 2	☐ 1. YES with card ☐ 2. YES without card ☐ 3. No ☐ 8. Don't know ☐ 9. Not applicable
ch_vita	Has (CHILD name) received vitamin A in the last 6 months?	☐ 1. Yes ☐ 2. No ☐ 8. Don't know
ch_bf1	Has (CHILD name) ever breastfed?	☐ 1. Yes ☐ 2. No ☐ 8. Don't know

Code	Question	Answer options
ch_bf2	After delivery of (CHILD name) when did he/she start breastfeeding?	☐ 1. Less than one hour ☐ 2. More than one hour ☐ 3. He/she never BF ☐ 8. Don't know
ch_bf2_2	Has (CHILD name) been breastfed since this time yesterday?	☐ 1. Yes ☐ 2. No ☐ 8. Don't know
ch_bf3	Did (CHILD name) have any drink other than breast milk?	☐ 1. Yes, only water ☐ 2. Yes, food and/or other drink ☐ 3. No
ch_mf	How many times did this child eat mashed, pureed, solid or semi-solid foods since this time yesterday (not including liquids or breast feeding)?	
ch_dd	From this time yesterday until now, what did (CHILD name) eat (tick all that apply)? A. Cereals B. Roots/tubers C. Carrot/pumpkin D. Green leafy veg E. Any other veg F. Papaya/mango G. Other fruits H. Meat/chicken I. Offal J. Eggs K. Fish L. Nuts and seeds M. Legumes/pulses N. Dairy products O. Oil and fats P. Sugar/honey/candy Q. Soft drinks/tea/coffee	
ch_dd1	A. Cereals	☐ 1. Yes ☐ 2. No
ch_dd2	B. Roots/ tubers	☐ 1. Yes ☐ 2. No
ch_dd3	C. Carrot / pumpkin	☐ 1. Yes ☐ 2. No
ch_dd4	D. Green leafy veg	☐ 1. Yes ☐ 2. No

Code	Question	Answer options
ch_dd5	E. Any other veg	☐ 1. Yes ☐ 2. No
ch_dd6	F. Papaya / mango	☐ 1. Yes ☐ 2. No
ch_dd7	G. Other fruits	☐ 1. Yes ☐ 2. No
ch_dd8	H. Meat or chicken	☐ 1. Yes ☐ 2. No
ch_dd9	I. Offal	☐ 1. Yes ☐ 2. No
ch_dd10	J. Eggs	☐ 1. Yes ☐ 2. No
ch_dd11	K. Fish	☐ 1. Yes ☐ 2. No
ch_dd12	L. Legumes/ pulses	☐ 1. Yes ☐ 2. No
ch_dd13	M. Nuts/ seeds	☐ 1. Yes ☐ 2. No
ch_dd14	N. Dairy products	☐ 1. Yes ☐ 2. No
ch_dd15	O. Oils and fats	☐ 1. Yes ☐ 2. No
ch_dd16	P. Sugar / honey / candy	☐ 1. Yes ☐ 2. No
ch_dd17	Q. Soft drinks / tea / coffee	☐ 1. Yes ☐ 2. No

Code	Question	Answer options
CHILD HB		
ch_ant	Child name (anonymized for ethical reasons)	
ch_hb	Hb measurement (record Hb reading in g/dl)	☐ _____ . (reading) ☐ 0. No sample ☐ 98. Refuses ☐ 97. Missing
ch_bc	Barcode (automatic by tablet)	
PC & PREGNANT WOMEN HB		
pc_m_n	PC name (anonymized for ethical reasons)	
hn4	Hb measurement (record Hb reading in g/dl)	☐ _____ . (reading) ☐ 0. No sample ☐ 98. Refuses ☐ 97. Missing
pc_bc	Barcode (automatic by tablet)	